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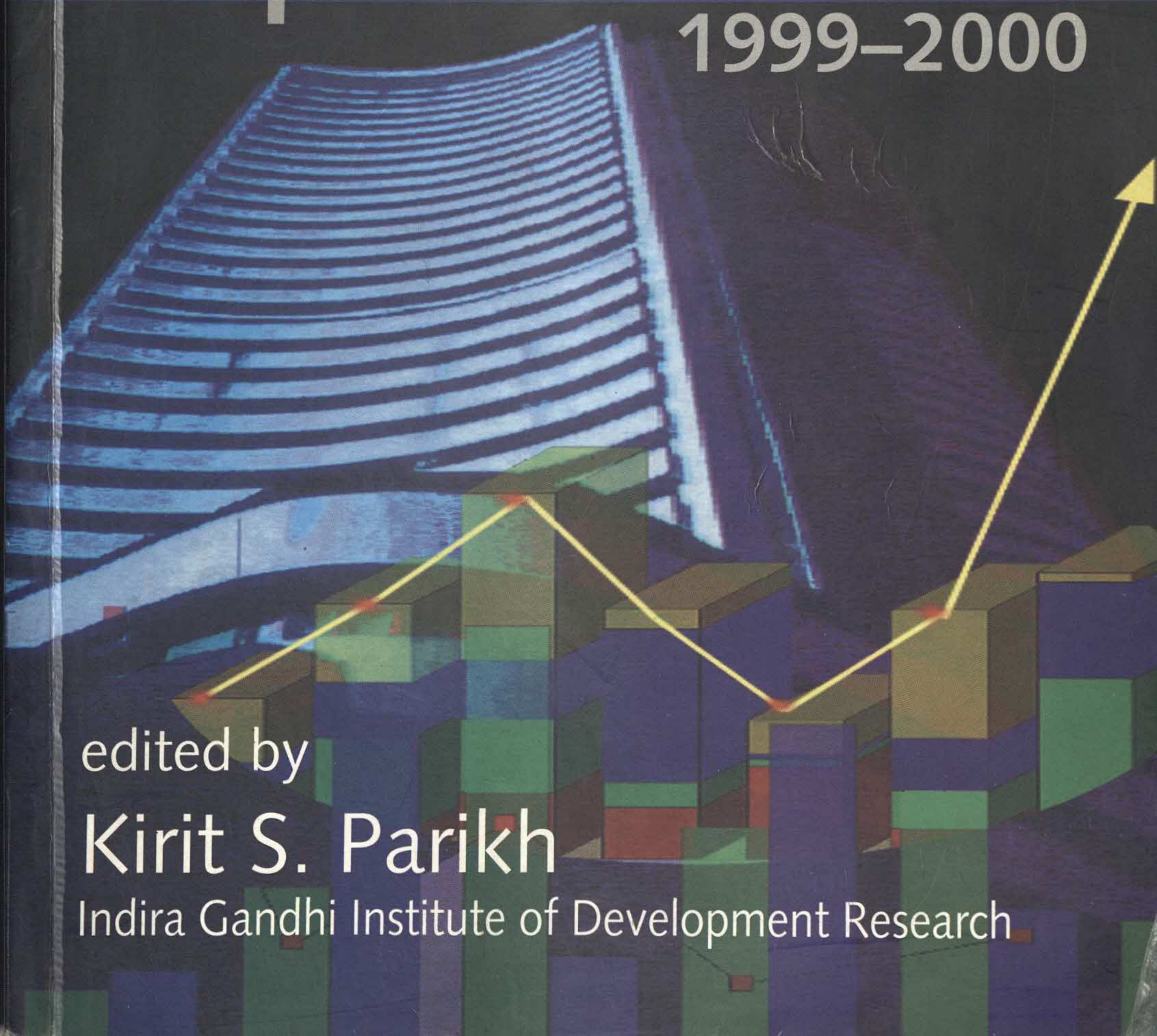
1999–2000



edited by

Kirit S. Parikh

Indira Gandhi Institute of Development Research

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1999–2000

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Indira Gandhi Institute of Development Research

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Preface

India's economy has experienced profound changes in the decade of the 1990s. With changes in the regulatory and institutional landscape, much of the traditional understanding of India's economy is obsolete. The priority of issues which merit attention has drastically altered and a new set of questions and issues has been thrust into prominence. Today, at the turn of the millenium, the Indian economy is at a critical juncture. The economic reforms of the 1990s have accelerated growth. We seem to be tantalizingly close to sustaining a growth rate of 8–10 per cent and yet, we seem unable to achieve it. What prevents this? How can we overcome the obstacles?

The *India Development Report (IDR): 1999–2000* is a comprehensive and contemporary treatment of the defining issues in the country. Chapters in this volume range over the issues of macroeconomic performance, poverty, education, pollution, urban transport, power, fossil fuels, taxation and deficits, imports and exports, corporate governance, insurance and risk, privatization, lessons to be learned from the East Asian crisis and 'the Second Generation of Reforms'. Each chapter assesses the current situation in the light of changes that have taken place since the initiation of reforms in the mid-1990s, provides sectoral insights, links them to the functioning of India's economy today, and suggests policy options for long-term growth prospects.

The earlier *IDR 1997* was well received by the public, as well as academic readers and critics. This *IDR* has also been prepared by faculty and researchers of the Indira Gandhi Institute of Development Research (IGIDR), an autonomous advanced research institute, established in 1987 to analyse problems of development and offer insights for policy formulation. The team is a multi-disciplinary one consisting of economists, engineers and scientists. The report is written in simple, non-technical language so that it is accessible to the general reader. At the same time, we have tried not to compromise on academic rigour. The views expressed in the report are those of the contributors and not of the Institute. Nevertheless, we hope that the presentation is objective and non-ideological.

The publication of *IDR 1999–2000* again provides us an opportunity to bring the research insights of IGIDR scholars to a wider audience. We believe that the results of this research can contribute to policy-making or, at least, to the debate on public policy. In *IDR 1997*, we had argued that the Indian economy would continue to grow despite the political uncertainty faced, though it would grow faster with political stability. The frequent changes in government we have seen since then and the likelihood of continued coalitions makes a wider understanding of policy issues facing the nation that much more important.

As the Director of a policy research institute, I am often asked about the impact our research. Does anyone listen to us? How do we communicate our research findings to decision makers? We are all decision makers in our democratic set up, particularly when it is passing through a phase of political instability, and the reforms yet to be carried out require wide public consensus. We need to engage the largest possible segment of society in such debates. This report is IGIDR's contribution to this process.

It is my pleasure and also my privilege to thank my colleagues and students who have contributed, directly or indirectly, to *IDR 1999–2000*.

Mumbai
15 May 1999

KIRIT S. PARIKH

Contents

List of Figures xiii

List of Tables xv

Overview 1
Kirit S. Parikh

Reforms: The Task Ahead 2
The Macroeconomic Scene 3
Poverty and Social Insecurity 5
Primary Education: A Dismal Record 6
Air and Water Pollution: New Initiatives Needed 7
Urban Transport: A Growing Problem 9
Power Sector Reforms 9
Coal, Oil, and Gas 11
Political Economy of the Revenue Deficit 12
India's Public Finance: The Issues 13
Tax Evasion, Amnesty Schemes, and Black Income 14
India's Export Competitiveness 15
Exporting in a Globalized Economy 16
Corporate Governance and Share Ownership 17
The Insurance Sector 18
Financial Sector 20
The East Asian Crisis: Lessons for India 22
How to Go about Privatization? 23
References 24

1. **Second Generation Reforms** 25
Kirit S. Parikh and Ajay Shah

The Decline of Traditional Industrial Mass Production 25
Increasing Economic Concentration 25
Accelerating Technological Progress: More Power for the Powerful? 26
The Advantages of an Open Society 26
Globalization: A Fact, not an Option 27
Financial Sector Integration 27
Outward Orientation—II 28
Facing the New Millennium: The Second Generation of Reforms 29
In Conclusion 34

2. **Macroeconomic Development and Prospects** 35
Manoj Panda, Gangadhar Darbha, and Kirit S. Parikh

Introduction 35
Macroeconomic Developments and Problems 35
An Assessment of the Long-term Growth Process 46
References 47

3. **Persisting Poverty and Social Insecurity: A Selective Assessment** 49
S. Mahendra Dev and Ajit Ranade

Introduction 49
Recent Poverty Estimates and Trends 50
Rising Food Prices and the Poor 53
Poverty Alleviation Programmes: Issues and Experiences 56
Prognosis for Growth in Agriculture 62
Other Aspects of Social Insecurity 62
Concluding Comments 66
References 66

4. **Primary Education for All** 68
Madhura Swaminathan and Vikas Rawal

Introduction 68
Why Education? 68
What have We Achieved? 69
Compulsory Education 75
Current Expenditure Trends 78
Financing Universal Primary Education 80
Conclusions 83
References 83

5. **Air and Water Quality Management: New Initiatives Needed** 85
Kirit S. Parikh, Jyoti Parikh, and Tata L. Raghu Ram

Introduction 85
Air Quality Scenario in the Country 85
Water Resources 87
Why are Air and Water not Treated Adequately? 89
Cost of Providing Drinking Water, Sanitation, and Wastewater Treatment 90
Cost of Air Pollution Control 92
Pollution Management Policies in India 93
How to Improve Air and Water Quality 95
References 96

6. **Urban Transport** 98
R. Ramanathan

Introduction 98
Urbanization in India 98
Patterns of Growth of Urban Transport in India 99
Issues Associated with Urban Transportation Trends 100
Steps Ahead: Key Policy Suggestions 103
Summary 111
References 111

7. **Power: The Critical Infrastructure** 113
Anjana Das, Jyoti Parikh, and Kirit S. Parikh

Introduction 113
Present Status 113
Power Sector Reforms 115
Some Issues Related to Power Sector Reform 121
Concluding Remarks 123
Glossary 124
References 124

8. **Coal, Oil, and Gas** 125
Anjana Das and Jyoti Parikh

Energy Sources 125
Coal Industry in India 126
Petroleum 130
Natural Gas 136
Concluding Remarks 139
References 139

9. **The Political Economy of the Revenue Deficit** 140
Ashima Goyal

Introduction 140
Is the Government Profligate or is It Cash Starved? 141
Interventions and Incentives 146
Interventions and Outcomes 147
Concluding Remarks 150
References 150

10. **India's Public Finances: Select Issues and Suggested Reforms** 152
Raghbendra Jha

Introduction: Characteristics of Tax Reform 152
Public Expenditure 155
Some Important Consequences 157
Some Policy Suggestions 158
Summary and Conclusions 161
References 161

11. **Tax Evasion, Amnesty Schemes, and Black Income: Theory, Evidence, and Issues** 165
Shikha Jha

Introduction 165
Measuring Tax Evasion 166
Improving Compliance: Amnesty Schemes and Other Methods 168
Consequences of Black Economy 171
Size of Underground Economy 173
Summary and Policy Conclusions 174
References 175

12. **India's Export Competitiveness and Finance** 177
A. Ganesh-Kumar, Kunal Sen, and Rajendra R. Vaidya

Introduction 177

Important Policy Changes 178
Overview of Trade Flows 180
Sectoral Competitiveness 182
Financing Patterns and Investment: Exporting Firms versus Domestic Firms 187
Conclusion 190
References 190

13. Exporting in a Globalized Economy 191
K. V. Ramaswamy

Introduction 191
Globalization and Growth in Global Production 191
Global Commodity Chains and Export Networks 193
Possible Strategies for Indian Exports 196
How Can India Enter into Global Production Linkages? 197
Conclusion 199
References 199

14. The Governance of Indian Corporates 201
Jayati Sarkar and Subrata Sarkar

Introduction 201
The Fundamentals of Corporate Governance 202
The Indian Corporate Sector 205
Institutions of Corporate Governance in India 208
Governance of Indian Corporates: The Current Scenario 212
Emerging Policy Issues 216
References 218

15. Insurance 219
Ajit Ranade and Rajeev Ahuja

Introduction 219
Insurance Basics 220
Scepticism about Market Structure 222
Regulatory Framework 223
The Current Insurance Scenario 224
Benchmarks from Abroad 226
Key Emerging Areas 227
The Political Economy of Insurance Reforms 229
Concluding Comments 229
References 230

16. Risk and the Indian Economy 231
Susan Thomas and Ajay Shah

Risk and Economic Liberalization 231
Risk Measurement 232
Risk in Three Major Financial Markets 235
Derivatives: Markets for Risk 239
Risk and the Conduct of Economic Policy 242

17. Rethinking Prudential Regulation 243
Ajay Shah and Susan Thomas

The Sources of Financial Firm Fragility 243

Objectives of Prudential Regulation 245
Existing Ideas in Prudential Regulation 246
Flaws in the Prudential Regulation of an Exchange 249
Flaws of the Basle Accord 250
The Way Forward 251
References 255

18. The East Asian Crisis of 1997: Some Implications for India 256
Subir Gokarn

Introduction 256
Perspectives on Crisis 256
Perceptions of the East Asian Crisis: A Selective Overview 257
Integrating the Role of Proximate and Structural Factors 259
Implications for India 264
Conclusions 265
References 265

19. Privatization and Auctions 267
P. G. Babu and Nibedita Das

Introduction 267
Privatization: The Global Scene 268
Methods of Privatization 269
Auction Forms 270
Private Entry in Indian Telecommunications 272
Analysis of the Auction Mechanism in the Indian Telecommunications Sector 274
Lessons to Learn: The US Spectrum Auctions 276
Concluding Remarks 277
References 277

Appendix Tables 281

Figures

3.1 Participation of Households in Wage Employment and Credit (IRDP) Programmes (by expenditure classes) 1987–8, 1993–4 58
4.1 Pupil–teacher in Primary Schools in Different Countries, 1994 75
4.2 Total Central Government Expenditure on Education 1989–90 to 1998–9 80
5.1 Air Emission Accounts for 1989–90 86
6.1 Variation of Vehicular Population with City Size (excluding Delhi data) 100
8.1 Grade Mix of Non-coking Coal Production 127
9.1 Public Sector Savings as a Percentage of GDP 142
9.2 Public Sector Capital Formation as a Percentage of GDP 142
9.3 Public Sector Expenditure as a Percentage of GDP 143
9.4 Current Expenditure by Government Administration as a Percentage of GDP 143
9.5 Capital Expenditure by Government Administration as a Percentage of GDP 144
9.6 Expenditure of Administrative Departments as a Percentage of GDP 145
9.7 Income of Administrative Departments as a Percentage of GDP 145
9.8 Compensation of Employees and Operating Surplus in Non-departmental Enterprises as a Percentage of GDP 146
10.1 The Notion of Excess Burden of Taxation 152
12.1 India's Trade Balance, Current Account Balance, Exports, and Imports 180
12.2 Openness and Composition of India's Exports 181
12.3 India's Relative Export Performance 181
12.4 Real Effective Exchange Rate of the Rupee 182
12.5 Herfindahl Index of India's Export Diversification 184
14.1 Relation between Equity Holding and Company Value 214
14.2 Distribution of Companies according to Debt and Equity Holdings 215
14.3 Company Performance according to Debt and Equity Holdings 216
16.1 The Dollar–Rupee Exchange Rate April 1990–September 1998 238
17.1 Novation at the Clearing Corporation 247
17.2 The Repo 252

Tables

2.1 Annual Growth Rates of GDP and Major Sectors in the Economy 36
2.2 Selected Indicators for the External Sector 39
2.3a Exports of Principal Commodities 40
2.3b Principal Imports 40
2.4 Balance of Payments 40
2.5a Government Deficits: Central Government 44
2.5b Government Deficits: Centre and States 44
3.1 Comparison of Per Capita Income and Labour in Agriculture 50
3.2 Urban and Rural Poverty at State Level 51
3.3 Percentage of Population below the Poverty Line 52
3.4 Head Count Ratio and Gini Coefficients, Urban and Rural 53
3.5 Adjusted and Unadjusted Gini Coefficients 54
3.6 Percentage Distribution of Monthly Per Capita Consumer Expenditure (MPCE) by Item over NSS Rounds, Rural India 55
3.7 Percentage Distribution of Monthly Per Capita Consumer Expenditure (MPCE) by Item over NSS Rounds, Urban India 55
3.8 Persons in Rural Areas below Poverty Line and below Calorie Norm 55
3.9 Comparison of Cost-effectiveness in the EGS and PDS in India 58
3.10 Cost per One Rupee of Income Transferred by Various Programmes 61
3.11 Annual Compound Growth in Foodgrains Production 62
3.12 Percentage of Illiteracy among the Aged and among those in the Age Group 15 years and above, All India 1993–4 63
4.1 Proportion of Children Attending School, Aged 5–14, 1987–8 70
4.2 Proportion of Children Currently Attending School, Aged 5–14, 1993–4 70
4.3 Distribution of Primary Schools by Number of Teachers, 1993 74
4.4 Total Expenditure of Central and State Governments on Education, 1951–2 to 1996–7 79
4.5 Public Expenditure on Education 79
4.6 Investment Requirements for Five Years for Universal Schooling of Children in the Age Cohort 6–11 81
5.1 Burden of Water-related Diseases in India, 1990 89
5.2 Costs of Domestic Wastewater Treatment 91
5.3 Cost Effectiveness of Alternate Vehicle Pollution Control Scenarios 93
6.1 Trends in the Growth of Metropolitan Cities in India 98
6.2 Mobility and Congestion Indicators for Selected Cities 101
6.3 Average Annual Emissions Compared to National and International Standards, 1993 102
7.1 Power Plants in Operation under the Private Sector, 1998 117
7.2 Share of Industry in Power Consumption in Different States 122
8.1 Projected Demand of Different Energy Sources 125
8.2 PPA for Gasoline and MS before and after Price Hike on 2 July 1996 132

8.3 Emissions from Coal (Imported)-based Plants *vis-à-vis* Gas-based Plants 138
9.1 Income and Outlay Account of Administrative Departments 144
10.1 Share of Direct and Indirect Taxes in Total Tax Revenues of Centre, States, and Union Territories 154
10.2 Characteristics of Expenditure Patterns of Central and State Governments 156
A10.1 Tax Revenues as a Percentage of GDP 1990–6 162
A10.2 Taxes on Goods and Services as of Current Revenue 1990–6 162
A10.3 Taxes on Income, Profits, and Capital Gains as a Percentage of Current Revenue 1990–6 163
A10.4 Central Government Total Debt as a Percentage of GDP 1990–6 163
A10.5 Overall Budget Deficit, including Grants, as a Percentage of GDP 1990–6 164
A10.6 Short-term Debt as a Percentage of Total External Debt 1990–6 164
11.1 Magnitude of Temporary Amnesties in the Past 170
11.2 Break-up of National Income and Taxable Income 173
12.1 Commodity-wise Shares in India's Total Exports 183
12.2 Winner and Loser Commodities 185
12.3 Distribution of Manufactured Exports by Technological Complexity 186
12.4 Firm Characteristics 188
12.5 Sources and Uses of Funds 189
13.1 India's Export Share in Selected Globalized Products in 1994 194
14.1 A Comparison of German, Japanese, and US Governance Systems 202
14.2 Pattern of Equity Ownership in Different Types of Companies 206
14.3 Distribution of Outstanding Corporate Equity for Select Countries 207
14.4 Stock Market Indicators of Selected Countries 1996 210
14.5 Performance of Different Types of Companies 214
15.1 Composition of Household Savings 221
15.2 Insurance, Provident, and Pension Funds 222
15.3 Growth of Life Insurance 225
15.4 General Insurance: Some Indicators 226
15.5 International Comparison of Insurance Penetration: Premium/GDP 227
16.1 Volatility of Daily Returns, by Year 235
16.2 Evidence of Dependence in Volatility across Time 236
16.3 VaR of Nifty: Two Scenarios 237
16.4 VaR of Dollar–Rupee 238
18.1 Classification of Factors/Variables 259
18.2 Ratio of Short-term Debt to Total External 260
18.3 Ratio of Short-term Debt to International Reserves 260
18.4 Foreign Direct and Portfolio Investment Flows 261
18.5 Growth Rate of Domestic Credit 261
18.6 Interest Rates and Growth Rate of GDP 262
18.7 Overall Budget Surplus/Deficit 262
18.8 Current Account Balance 262
18.9 Growth Rates of Merchandise Exports 263
19.1 Global Privatization Revenues by Sector 1990–6 268
19.2 Circle-wise Highest Bidders in Basic Telecommunications 274
19.3 Circle-wise Reserve Price and Bids for Second Round 274
19.4 Circle-wise Reserve Price and Bids for Third Round 274

Appendix Tables 281

Overview

Kirit S. Parikh

The state and pace of India's development show many troubling signs at the beginning of 1999. In the early 1990s, there was a dream which seemed to be tantalizingly within reach—the dream of becoming a new tiger, a fast-growing miracle economy, of finding just one decade of gross domestic product (GDP) growth at 7 per cent per year, so that poverty could be wiped out. However, this dream remains elusive.

The excitement and optimism generated by the reforms process have abated. The ability of policy makers to obtain radical changes, as in the early 1990s environment of macroeconomic crisis, greatly diminished in the following years. The progress of reforms has been blocked by special interest groups in numerous areas.

Industrial growth, while still positive, has decelerated. Exports growth fell in 1999. Infrastructure bottlenecks persist. Poverty, illiteracy and ill-health still remain major problems, and are aggravated by the worsening environment. In three years, the country has seen four governments which seem unable and unwilling to confront the deeper problems plaguing the economy. The environment of political instability, coupled with nuclear tests and sectarian violence, has not provided atmosphere conducive to domestic and foreign investment.

At the same time, there are many positive aspects to the situation. In spite of the industrial slowdown and pessimism, the economy is growing at over 5 per cent per year, the new 'Hindu' growth rate (the one at which the economy keeps growing no matter how badly economic policy is formulated!). Inflation is under reasonable control. Exports seem to be turning around. Many steps have been taken to liberalize the financial sector, and policy makers successfully obtained radical institutional development in the securities markets from 1994 to 1996. Many new initiatives are under way for the infrastructure sector. The incidence of hunger, as felt subjectively at least, is dramatically reduced.

A new breed of skills has come to exist in the areas of technology and management, which simply did not exist in 1990. While this is epitomized by the remarkable success of Indian firms in the area of information technology (IT) in the 1990s, the extent of change extends far beyond IT firms: the standards of efficiency and competition amongst India's firms are unrecognizably different than a decade earlier. This is, to a major extent, the consequence of the substantial reduction (though not elimination) of state-sponsored entry barriers in India's markets.

There has been a sea change in *ideas* about the role of the state and the role of markets in India's economy. Discussions and ideas about how the country should function, that we take for granted today, would have been considered profoundly subversive in 1990. All political parties, when in power, seem to share certain basic goals about economic policy formulation; however, they are cynically consistent in blocking reforms when out of power.

The last two years have seen dramatic swings in sentiments about India's economic development.

- The enthusiasm and expectations for a stable high growth generated by the 'dream budget' of Chidambaram in February 1997 were soon dissipated by the political instability precipitated by the Congress party.
- A steady slide into pessimism was aggravated by the East Asian meltdown later in 1997.
- The second UF government fell in early 1998.
- The coalition government led by the BJP, which had 'swadeshi' as one of its election planks, came to power in March 1998. The first budget of Yashwant Sinha, in its effort to give a 'swadeshi' glaze by imposing a special additional duty (SAD) of 8 per cent (subsequently rolled back to 4 per cent) on all imports, only ended up creating uncertainty regarding the reversibility of reforms. The macroeconomic slowdown which followed probably hurt 'swadeshi' industrialists more than the SAD benefited them.

- The nuclear tests in May 1998 and the subsequent sanctions led to further slowdown of the economy.
- The budget presented by Yashwant Sinha in February 1999 once again created a positive mood. It promised to carry forward reforms and to stimulate the economy. The stock market reacted positively, gaining 14 per cent in the fortnight following the budget.[1] Then on 17 April, the Vajpayee government fell.

In this context, the key questions concerning India's development may be summarized as follows:

- How has the macroeconomy been performing and what are the prospects in the near future?
- What are our long-term growth prospects?
- How can investment and exports be revived? How can our export competitiveness be improved in the new international scenario?
- Why did inflation spike in 1998? Will such episodes recur?
- How can our large and worsening fiscal deficit be brought under control?
- How should taxation be reformed so as to minimize the distortions and maximize revenues? Are amnesty schemes a good way to improve compliance?
- What is the incidence of poverty, and what can we do to alleviate it?
- Why have we fared so badly in providing elementary education? How can we improve matters?
- What is the extent of air and water pollution and how can it be controlled?
- How can urban transportation be improved?
- Why do power shortages persist? Why has private domestic and foreign investment in the power sector not taken off?
- What is the situation regarding fossil fuels?
- In the corporate sector, what are the implications of the conflicts of interests between owners and managers? How can managers be induced to share the goals of the owners?
- What issues arise for insurance reform in India?
- What are the recent developments in India's financial markets?
- How should risk be measured?
- How can the robustness of finance companies be ensured by regulators? How can financial crises be avoided?
- What lessons does the East Asian crisis hold for India?
- How should privatization of PSUs take place?

These are the questions addressed in this Report in the chapters that follow. An overview based on these chapters follows.

REFORMS: THE TASK AHEAD

India's development has to proceed in the context of likely evolution of the global economy. An understanding of the directions of change in it provides a framework to assess our development performance. It also suggests the second generation reforms that we need to undertake and their relative importance.

In Chapter 1, Kirit Parikh and Ajay Shah argue that for India, globalization is no longer an option: it is a fact. In the globalizing world economy sustained by mass consumption, increasing economic concentration and dominance by transnational corporations (TNCs) is likely. Accelerating technological progress shortens product cycle and, further, accentuates the tendency towards large global corporations. With increasing prosperity in post-industrial societies, demand for distinctive products and services will increase. Modern IT makes it possible to provide consumers with mass-produced personalized products (MPPPs). The IT revolution opens up possibilities for white collar workers (while sitting in India), to provide many services to the world. The financial integration accompanying globalization poses new challenges for policy makers. With appropriate policies, we can benefit a lot but it also exposes the country to risks.

To benefit fully from globalization, to turn it into an opportunity, India has to adapt its policies. Second generation reforms have to be carried out.

Some of the inputs which will help in exploiting the knowledge-based economy are telecom facilities at international prices, thriving institutions of higher education, an open and democratic society which is hospitable to innovation, protection for intellectual property rights (IPR), and a financial sector that can fund high risk projects.

Flexibility is critical if Indian firms are to be TNCs. For this, we need an exit policy, labour law reforms, freer trade both domestic and international, and first rate financial markets that permit risk hedging and provide capital at competitive rates.

We also need many other reforms: we should free our farmers of restrictions on storage and trade, create a safety net, empower the poor, push human development with compulsory elementary education, protect our environment, improve governance, and reform our legal system.

---

[1] On 26 February, the national stock exchange market index had closed at 941.20. Two weeks later on 12th March, it was 1072.65.

This is what needs to be done. What has been our performance?

THE MACROECONOMIC SCENE

In Chapter 2, Manoj Panda, Gangadhar Darbha, and Kirit Parikh examine and analyse the performance of the Indian economy over the last two years, its prospects in the future, and the critical policy issues.

How has the Economy been Performing?

After the wide-ranging reforms initiated in 1991, GDP, which measures the aggregate income in the economy, grew over 7.5 per cent for three years in succession during the fiscal years (April to March) 1994–5 to 1996–7 giving rise to hopes of a sustained higher growth path for the economy. Inflation seemed to be under control. Exports and imports too expanded substantially. There was a large flow of foreign capital. However, this rosy picture did not continue. Several key indicators of the economy have taken a negative turn in the last two years. GDP growth rate has dropped to approximately 5 per cent since 1997; industrial growth has declined to below 6 per cent; industrial investment—both private corporate and public sector—has slowed down; inflation was up again at high rates for several months in 1998; fiscal deficit, for centre and states put together, continues to be around 8 per cent of GDP; exports are not growing and have in fact fallen in dollar terms, and foreign investment has slowed down.

Why has the Economy Slowed Down?

The proximate determinants of the deceleration in industrial output are deceleration in exports, industrial investment, and consumer demand (due to low growth of rural incomes), coupled with moderate growth in money supply and credit, and infrastructure bottlenecks.

Exports of manufactured goods have slowed down from a remarkable average annual growth rate of 16 per cent over 1991–5 to 3.5 per cent since 1996–7 in dollar terms, causing significant decline in the demand for industrial output. The deceleration in exports, in turn, is due to domestic factors such as an overvalued (non-competitive) exchange rate, infrastructure bottlenecks, and exogenous factors such as the East Asian crisis and deceleration in world economic growth. Several industries like steel, chemicals, and electronic components have been subject to competitive pressure from relatively cheaper imports.

The real value added in agriculture also declined during 1995–8 compared to 1991–4. This, in turn, led to a reduction in rural incomes which adversely affected the demand for industrial products, particularly for consumer durables.

There has been a sharp drop in both public and private corporate investment which has adversely affected the demand for industrial products through intersectoral linkages and resulted in lower industrial output. This fall in investment is due to various factors. One is the large deficit of the government, which has generated high interest rates and 'crowding out' of private and foreign investment. In addition, expectations about future growth have been marred by doubts about the sustainability of economic reforms, political instability, and episodes such as the nuclear tests.

How can Foreign Investment be Boosted?

On the external front, the foreign exchange reserves position has been comfortable due to the continuation of large capital flows and remittances. A major factor contributing to this comfort has been the funds raised using the Resurgent India Bonds—$4.3 billion were raised from non-resident Indians at 1.75 per cent above London interbank offer rate (LIBOR). These funds have, however, yet to be used for investment in infrastructure as promised. Similarly, investment flows of a few billion dollars have been delayed from international development agencies due to sanctions imposed after the Pokhran-II nuclear explosions. Had these investments occurred in 1998–9, they would possibly have pushed up GDP growth further by as much as 0.5 per cent.

A factor holding back long-term investment is the indecisiveness of policy makers. Announcements of liberalization generate a period of 'wait and see' since investors are concerned that the reforms may be reversed by special interest groups. Investors are looking forward to a set of clear signals from the government about the policy environment in which they are expected to operate. An environment with reduced uncertainty would reduce the 'hurdle rate' of expected returns which a project has to generate for it to be viable.

What can be done to Boost Falling Exports?

The Indian economy is increasingly integrated with the global economy. The share of foreign trade (exports and imports) in GDP rose from about 14 per cent in 1991–2 to above 20 per cent in 1997–8. Exports growth (in US dollar terms) has declined considerably since 1996–7, when compared with the growth rate of about 20 per cent witnessed for the previous three years. It fell further recently and became negative in the first half of 1998–9. Remittance income has continued to rise in recent years with a marked preference for the official channel, since the exchange rate has become increasingly market determinated. The growth in such invisible transactions has been a major source of strength in our balance of payments. Another area where exports continue to grow satisfactorily is software and other services.

World trade slowed down in 1998 compared to 1997, but this does not entirely explain the fall in India's exports. Part of the explanation also lies in the East Asian crisis of June 1997, which had two effects: exports to East Asia, constituting 15 per cent of our total exports (21 per cent, including Japan), fell; and more important, the East Asian currencies depreciated significantly compared to the Indian rupee (at one stage, the rupee had appreciated by 70 per cent in comparison). The sharp depreciation of the competing East Asian currencies adversely affected India's exports to other economies. In 1998, this was partly alleviated because of a depreciation of the rupee in combination with the recovery of currencies in East Asia.

We need a further depreciation of the rupee to boost exports. Depreciation would also lead to a rise in the price of imports and a decline in the relative profitability of import dependent sectors. Hence the right strategy to promote exports would be to permit an import neutral devaluation, where the devaluation would be accompanied by tariff reductions so as to leave import prices unchanged.

What Caused the Inflation Spike in 1998?

The rate of inflation, as measured by the wholesale price index (WPI), had come down steadily from 14 per cent in 1991–2 to less than 5 per cent in 1997–8 due to various demand and supply side measures undertaken by the government. An important aspect of inflation in the 1990s is that prices of primary articles such as foodgrains, have contributed more to overall inflation, as compared with the 1980s. The inflation rate rose to remain high for most part of 1998 and touched a peak of 17 per cent in November 1998. This was largely due to the shortage of some essential agricultural commodities following crop failures. The price of onions in particular rose more than five times to reach Rs 50 per kg in some cities. The government belatedly put onions and other agricultural commodities on open general licence (OGL), permitting open imports. Prices came down shortly thereafter and by the beginning of 1999 inflation had again come down to an annual rate of around 5 per cent.

This illustrates a key feature concering inflation in India: price rise of agricultural commodities is largely supply determined. When crops fail and adequate stocks are not available, imports are the way through which we can access the 'buffer stock' of the global market. The best way to harness these gains is to put all agricultural commodities on OGL and allow private traders to freely import agricultural commodities. Unlike the State Trading Corporation (STC), private traders have fast reflexes and will import rapidly at the slightest sign of a price rise.

However, agricultural prices often rise because government increases the support prices. In such a situation, increasing supply through imports would not help as the price rise is almost mandated by the government. Even monetary policy would be able to check the movement of only those prices that are determined by market forces. Its effectiveness in controlling aggregate inflation is greatly reduced in a regime where it is mostly administered (or nearly administered) prices that contribute to inflation. In such a situation, contractionary monetary policy can slow down growth in the economy while failing to rein in inflation.

How can the High Fiscal Deficit be Corrected?

Controlling the high fiscal deficit is the most challenging macroeconomic management problem facing the government. The deficit reduces public investment, raises interest rates, makes long gestation infrastructure projects less viable, crowds out private investment, and generates inflationary pressures. When the borrowings to finance such deficits cumulate, the interest burden becomes so heavy (as is the case in India now), that the government has little freedom to expand health and education services and anti-poverty programmes.

The fiscal deficit must be brought under control. This requires removal of non-merit subsidies, disinvestment of public sector units, widening the tax net, and more effective collection of taxes. Subsidies on non-merit goods currently account for an astonishing 11 per cent of GDP.

One way to phase out subsidies is to raise user charges at a rate which holds the quantum of subsidies constant *in absolute terms*. This would shrink subsidies compared with GDP. The next step could be a regime where user charges rise at inflation rates.

What are India's Long-term Growth Prospects?

Efforts to put the economy on a higher growth path in the early 1990s appeared to have been successful from 1994–5 to 1996–7, when the economy grew at above 7.5 per cent for three years in succession (above 6 per cent for four years, if we were to include 1993–4). Was this an isolated experience, or can such growth rates be achieved on a sustained basis?

We believe the Indian economy has reached a stage that could very well yield sustained growth rates of over 7 per cent, provided the right kind of policies are employed to realize this potential. The current slowdown in the economy should be viewed as a temporary phase and not as an indicator of a long-term path.

The overall domestic savings rate, which includes savings from corporate and government sectors, has been above 24 per cent in recent years. It could go up further by 2–3 per cent by continuing fiscal reforms. The investment rate could rise over and above domestic savings rate because of net foreign capital inflows. We can realistically target net foreign investment flows (foreign direct investment [FDI], portfolio investment, and medium-term commercial borrowing) of about $10–12 billion per year in the coming years. All this could give an environment where gross capital formation is as large as 30 per cent of GDP.

POVERTY AND SOCIAL INSECURITY

In the area of social improvement, post-Independence India has been able to eliminate famines common during colonial times. Many people now have access to safe drinking water and the number of underweight children is declining. Child and infant mortality has dropped substantially and primary school enrolment has risen. The poverty rate has gone down.

Yet India is far from where it could be. The absolute number of poor has risen over recent decades. Roughly 300 million of our people, or 1 in 3, live below the poverty line. While international comparisons of poverty are fraught with errors, available estimates indicate that India has the highest poverty rate amongst major countries. The life expectancy of 63 years is a full decade behind that of many developing countries. The illiteracy rates for men and women are higher than the average for low-income countries. The gap in literacy between men and women is among the highest in the world, one stark indication being that a girl is one-third less likely to attend secondary school than a boy.

Most of India's poor live in rural areas and are engaged in agriculture. The only viable long-term strategy for poverty eradication is (a) increasing incomes of those engaged in agriculture and (b) absorbing an increasing proportion of the labour force into industry and services. In the short term, poverty alleviation programmes, based on government interventions in labour and credit markets, could also help. These issues are addressed in Chapter 3 by S. Mahendra Dev and Ajit Ranade.

The reforms of the 1990s have generated better terms of trade for agriculture, in contrast with the anti-agriculture stance of preceding decades. Food prices rose substantially in the 1990s. In this context, we need to examine the impact of these changes on rural and urban poverty and other dimensions of social insecurity which affect the various vulnerable groups.

There are several subtleties in the relationship between food prices and poverty. In the short run, net purchasers of food (including agricultural labour, small farmers, and urban consumers) are hurt by higher food prices. In addition, in the long run, if real wages do not rise as fast as relative food prices, then the poor are hurt since they consume a greater proportion of their income as food. Real wages in agriculture can stagnate, even when the relative profitability of the agriculture sector rises, depending upon the supply of labour.

In the long run, the most effective anti-poverty programme is high economic growth, which creates opportunities in the form of productive employment for the poor. In addition, economic growth enlarges the base upon which tax revenues can yield resources for poverty alleviation programmes. Along with growth promoting policies, direct poverty alleviation programmes can help diminish poverty in the short run.

What is the Incidence of Poverty in India?

The basic facts about poverty in the 1980s and 1990s may be summarized as follows. Poverty rates declined impressively in the 1980s. The fraction of population below the poverty line dropped from around 54 per cent in 1983 to 36 per cent in 1989–90 in rural areas, and from 35 to 38 per cent in urban areas. Over the period 1991–7, urban poverty declined, but rural poverty has remained broadly unchanged. These figures mask tremendous interregional disparities in poverty levels and in rates of change.

The accurate measurement of poverty rates continues to be a challenge. One important source of data is the National Sample Survey (NSS) which lists the number of households that report they cannot obtain two square meals a day. This has dropped sharply from 19 per cent in 1983 to less than 5 per cent in 1994.

This suggests a difference between the incidence of poverty and hunger. However, the original poverty line defined in 1960–1 concerned food needs. Hence the disparity in these estimates raises questions about how the poverty line is adjusted to account for changing demography, food habits, and relative food prices.

How should Poverty Alleviation Programmes be Constructed?

Over the years, a wide variety of anti-poverty programmes have been attempted in India. The intuitive appeal of initiating such programmes is based on the seemingly small transfers (compared to the trillions of rupees spent by the government) required to lift millions of people out of poverty.

Poverty alleviation programmes invariably lose their effectiveness due to leakages, i.e. transfers to people who are not poor, and their inability to reach the poor. The poor can be identified by proxy indicators such as occupation, asset holdings, literacy rates, and status of children (school-going or not).

Programmes such as the public distribution system (PDS), which make no effort at restricting subsidies to the poor, are fairly inefficient in that only a small fraction of the programme outlay actually goes to the poor. Poverty alleviation programmes based on employment seem to be rather effective; non-poor people do not come forward to accept the low-wage jobs that these programmes offer, and once a person escapes poverty he would voluntarily exit the programme. Hence employment programmes are self-targeting and self-liquidating. For example, in the Employment Guarantee Scheme (EGS), almost 90 per cent of the participants are poor. Empirical evidence suggests that wage employment programmes seem to be more effective at targeting the poor than programmes such as the Integrated Rural Development Programme (IRDP) under which productive assets (such as a buffalo) are given to the poor.

Programmes run by non-govenmental organizations (NGOs), like the Self Employed Women's Association (SEWA), have been more successful in terms of use of credit, repayment, and empowerment of women, although their scale of operation is not large.

For women and children, nutrition-based programmes, which have both short- and long-term benefits, are very important. Examples include the Tamil Nadu Integrated Nutrition Project (TINP-I and TINP-II). This project aims at improving the health status of pre-school children, as well as that of pregnant and nursing mothers.

Old age income and health security, especially of the poor, remains an area to be tackled effectively. The National Social Action Plan includes pensions for the elderly below the poverty line and also free foodgrains, as announced in the 1999 Budget.

In conclusion, the best poverty-alleviation strategy for the long run is that of fostering high rates of economic growth. However, short-term interventions have a useful role to play. These should involve a combination of self-targeting wage employment programmes like the EGS, and women and children's schemes run with the assistance of NGOs which include nutrition, health, and micro credit. Finally, education and training initiatives, which would enable the poor to improve their job skills, can be a highly effective means of poverty alleviation.

PRIMARY EDUCATION: A DISMAL RECORD

More than fifty years after Independence, we still have millions of illiterate people. In percentage terms, 27 per cent of men and a full 50 per cent of women in India are illiterate; this translates to 134 million men and 230 million women.

What is even more appalling is that roughly 50 million children in the age group of 6–11 are not attending school today. This directly translates to 50 million uneducated citizens of India for decades to come. Most of these 50 million children are predestined to go through their lives without reading newspapers, filling in forms, obtaining blue collar industrial jobs, and participating in the information age. This lack of education diminishes their options for the future and ensures existence on the edge of poverty. The uneducated child of today will become the uneducated voter of 2015 AD.

The basic questions that we must address are: what can we do about our dismal record in the sphere of primary education? Is poverty the main cause of our low achievements in primary education? What would it cost to finance universal primary education? These questions are dealt with in Chapter 4 by Madhura Swaminathan and Vikas Rawal.

Why is Education Important?

It is widely known but worth repeating that education is of value in itself (intrinsic value) and is valued for what it can do (instrumental value). Education is desired for itself as it opens up a vast world of opportunities and ideas to the educated person. It is also of great instrumental value in the process of economic growth and development. Education plays a critical role in demographic transition; female education, in particular, is important in the process of lowering fertility and mortality. Primary schooling is associated with better health outcomes. There is strong empirical correlation between literacy and life expectancy. An educated and skilled workforce contributes to higher economic growth. In political and social terms too, schooling creates an educated population and a more knowledgeable citizenry. Education empowers and, through empowerment, affects larger social processes.

Why is Our Performance So Poor?

Widespread illiteracy prevails in India because we have neither made primary education compulsory, nor have we provided adequate resources to equip schools with needed infrastructure and teachers. Our efforts in terms of translating a given expenditure on educational services into educational outcomes are marred by poor efficiency.

The situation in India today is one of low achievement in education combined with significant inequalities across sexes, regions, classes as well as castes and communities. Tangible progress has been made between 1987–8 and 1993–4 in school enrolment but the situation is far from satisfactory. Particular attention needs to be paid to the gender gap in educational achievements, and to promoting the education of females.

A closely related problem is that of child labour. India has the dubious distinction of having the largest number of child workers in any country in the world. A widespread consensus existed across all political parties in India against making primary education compulsory. Under misplaced compassion, it was argued that children contribute to family income and time spent in education would deprive poor families of this income. This argument condemns a vast number of children to a life of ignorance and poverty. The right response would have been to ensure that children go to school and to compensate poor families through other means.

Absenteeism of teachers is a major problem in rural schools as the local communities do not have any control over the teachers and what they teach. One proposed solution would be to vest control of schools in local communities or panchayats which would make decisions regarding the employment of teachers.

Teachers are, perhaps, the most important resource in a school. There is little doubt that the schooling system in India needs more teachers. The quality of school infrastructure in the country is deplorable. It is clear that expansion of primary education requires large-scale expansion of basic school infrastructure and upgrading of facilities in existing schools.

Would Compulsory Schooling be Effective?

The process of universalizing primary education can be catalysed by introducing a law for compulsory schooling. Universal education requires universal formal schooling, and universal schooling needs to be made compulsory and free. The 83rd Constitutional Amendment Bill introduced by the United Front government in 1997, to make schooling compulsory, should be discussed and legislated.

At the same time, we should recognize that the quality of schools has a major impact upon enrolment rates. The experience of many voluntary agencies and field surveys has shown that the poorest of parents are eager to send children to school, once good quality schools exist in the neighbourhood.

What would Universal Primary Education Cost?

The task of providing primary school education to all children requires stepping up of expenditure on primary education. Data on school attendance from the 50th round of the NSS show that about 47 million children in the age group 6–11 were not attending school in 1995. We estimate that total annual expenditure required for universal primary schooling is of the order of Rs 281 billion, i.e. about 2.8 per cent of GDP annually to provide adequate quantity and quality of primary schooling compared to current expenditure of 1.5 per cent on primary education. The expenditure required for those currently not in school is of the order of 1.8 per cent of GDP. In the National Policy on Education 1986, the government promised to increase public spending on education from 3.4 to 6 per cent of GDP during the Eighth Plan. This promise must be fulfilled.

To attain the goal of universal primary education, legal compulsion and adequate public expenditure must be combined with social and political changes including changes in teacher and parent motivation.

AIR AND WATER POLLUTION: NEW INITIATIVES NEEDED

One indicator of the quality of life is a clean environment, which can be disaggregated in terms of air quality, water quality, and noise. This is discussed in Chapter 5 by Kirit Parikh, Jyoti Parikh, and T. L. Raghu Ram.

The air in our cities has become highly polluted. In the ten largest cities in India, annual average levels of suspended particulate matter (SPM) are at least 3 to 5 times higher than the World Health Organization (WHO) standards. Many medium sized cities have air pollution levels comparable with the mega-cities. Indoor air pollution, which adversely affects vulnerable sections of society—such as women, children, and senior citizens in rural households—has so far been neglected. Water quality in all major rivers is lower than that prescribed by the Central Pollution Control Board (CPCB). Pathogenic water pollution due to domestic and human waste is the cause of many water borne diseases. Water is most of our rivers is not even fit for bathing, let alone drinking.

What is the Impact of Air and Water Pollution?

Air and water pollution affect human health and economic productivity and cause ecological changes that increase the risks of environmental disasters.

A research effort at IGIDR (1994) has estimated that, in Mumbai, an additional social cost of Rs 100 million is associated with an addition of 10 micrograms μg per cubic metre (cu. m) of Sulphur Dioxide (SO_2) released into the atmosphere. The study estimated cumulative loss in property value in one ward of Mumbai, Chembur, for every 100 μg per cu. m increase in SPM concentration as Rs 2 billion at 1993 prices. Human health damage due to air pollution in Delhi is valued at nearly Rs 1.2 billion per year. Indoor air pollution due to use of bio-fuels is estimated to cause around half a million premature deaths every year. The World Bank (1993) found that ambient air pollution in thirty-six Indian cities/towns, each year, accounts for 40,350 premature deaths; 19.8 million hospital admissions and sickness requiring medical treatment; and 1.2 billion occurrences of minor sickness.

The World Bank study also reports that water-related diseases kill 1.5 million children below age five every year, and cost 200 million person-days of lost work. About 30.5 million disability adjusted life years (DALYs) are lost each year due to poor water quality, sanitation, and hygiene. If we take merely the economic value of a life year at the average per capita GDP of Rs 12,000 per person, the annual loss of 30.5 million DALYs is worth Rs 366 billion. We should be willing to spend at least this much annually, to provide drinking water and sanitation to all.

Who Pollutes Air and Water?

Sectoral air pollution emission accounts prepared by the IGIDR for 1989–90 indicate that emissions from the household sector (indoor air pollution) contribute substantially to air pollution in the country. The transport sector contributes most of the pollution load in urban areas. The industrial sector contributed 2 million metric tonnes of pollutants in 1995 out of a total of 25.93 million metric tonnes.

All the three main sectors, viz. domestic, agriculture, and industry, contribute to water pollution. Domestic and municipal effluents are estimated to constitute 75 per cent of India's wastewater by volume. Wastewater treatment facilities in our cities/towns are grossly inadequate. Of the 2901 large water-polluting industrial units discharging effluents into rivers and lakes, 2026 (69.8 per cent) do not have adequate treatment facilities. Fertilizer consumption has increased from 7.7 million tonnes in 1984 to 13.9 million tonnes of nutrients in 1995–6. The use of technical grade pesticides has increased from 24,305 tonnes in 1971 to 85,030 tonnes in 1994–5. Fertilizer run-off leads to eutrophication in the receiving water bodies. Pesticides get accumulated in the food chain and cause health as well as ecological damage.

Why are Air and Water not Treated Adequately?

Air and water polluting industries often make a one-time investment in setting up of pollution control devices, especially if the investment is small and compliance mandatory. However, many firms that set up pollution control devices do not run them if the operating maintenance costs are substantial. Pollution control boards (PCBs) are unable to enforce standards for want of adequate resources and technical facilities to measure and monitor emissions and effluents. From thousands of court cases initiated by PCBs, only a handful of convictions are obtained. Public sector firms are as negligent of the environment as private firms. About 57 per cent of the total water polluting industries are in the cooperative, state-public, or central-public sector.

Water pollution from the domestic sector is due to non-implementation of legal stipulations, lack of financial resources to provide sanitation, sewage and treatment facilities, and lack of awareness. Agricultural pollution is due to the fact that so far there are no restrictions on the use of fertilizers and pesticides.

What are the Pollution Abatement Costs?

Controlling industrial air pollution often involves more efficient use of fuels, which can save enough to pay for the efficiency measures. Imposing emission standards on new equipment can be particularly effective given the fact that the bulk of the capital stock in the economy, as of 2010, will be acquired between today and 2010. More difficult is the control of vehicular and indoor emissions. The annualized avoidance cost for vehicular pollution in Delhi, using catalytic converter technology, is estimated to be Rs 800 million at 1995 prices.

For indoor air pollution control, improved biomass stoves and ventilation are the most cost-effective options for the near future. A complete transition to liquid and gas fuels (kerosene, LPG) is the long-term option.

There are still 375,000 villages/habitations in the country with drinking water related problems. In the Ninth Five Year Plan, a proposed outlay of Rs 400 billion is made for rural water supply to cover these problem villages/habitations. Constructing toilets (pour flush sanitary latrines) for each housing unit, would imply an expenditure of Rs 460 billion.

Providing sewage systems to collect wastewater and feed it to treatment plants also needs huge investments. The urban population of India is projected to rise to 307 million by 2001, and this will generate 24.5 billion litres of wastewater per day requiring Rs 40 to 60 billion worth capital equipment to process it. The annual cost of water pollution abatement in major water polluting industries (inclusive of wage bill, material cost, and power cost) is estimated at Rs 14 billion, which is about 1.17 per cent of the annual turnover of all major water polluting industries.

What New Initiatives are Needed for Pollution Control?

The very poor quality of air and water in many parts of the country suggests that the existing legal and incentive policies have not worked. The reasons for this failure are not hard to see. Existing legislation is ineffective given the low standards of enforcement. The PCBs are poorly staffed, lack technical facilities for measurement and monitoring, have meagre financial resources and are subject to political pressures.

A combination of command and control policies, technological interventions, and fiscal and economic instruments is needed for effective air and water pollution control. This will involve strengthening of PCBs for strict enforcement, measurement and monitoring of pollutants, imposition of pollution based taxes, enactment of full liability laws, right to pollution information for citizens, treatment of domestic wastewater, and curtailment of agricultural chemicals through integrated pest management and eco-friendly farm practices. In order to deal with vehicular emission control, we would need to phase out old vehicles from urban areas, encourage technological interventions (catalytic converters, four-stroke engines), introduce unleaded petrol in all urban areas, improve fuel quality, improve road quality for smoother traffic flow, and above all improve public transport systems in urban areas.

URBAN TRANSPORT: A GROWING PROBLEM

India has witnessed tremendous growth in urbanization since Independence. From 1951 to 1991, the number of metropolitan cities has increased from 5 to 23. Most of the smaller metropolitan cities have registered rapid population growth. The number of vehicles in a city is likely to grow approximately along an S-shaped logistic pattern as city size increases. The implications of this logistic pattern are that many smaller level Indian towns are likely to enter a rapid growth phase in the near future, leading to very high levels of vehicle growth. This growth raises the urgency of studying urban transport, which is dealt with in Chapter 6 by R. Ramanathan.

The growth of urban roads has simply not kept pace with the growth of urban population and vehicles. This inadequacy of the urban road network will be compounded by the expected rapid increase in the number of vehicles in India in the future. Over the years, the speed of vehicles in Indian cities has dropped. For example, in Mumbai, the average speed of vehicles has dropped from 38 kmph in 1962 to 26 kmph in 1979 and 15–20 kmph in 1993–4. This is in sharp contrast to the greater efficiencies of transport and communication which should accompany economic development.

How can We Deal with Urban Road Congestion?

Several strategies to overcome the problems of urban transport are available. Integrated planning of land use with the development of public transport in relatively small urban centres can prevent future problems. Mass transport systems can move more people while occupying lesser road space. However, it must be convenient, punctual, and fast if people are to use it. An integrated public transport system for travelling by different classes of buses and suburban rail (when it exists) can help make it so. Commercialization of bus stations and railway terminals can generate regular additional income and lower the cost of mass transport.

Economic pricing for the use of road (in the form of user charges) and fuel taxes can generate revenues which can be mobilized for additional investments. In the budget for 1999–2000 presented in February 1999, a cess of a rupee per litre of diesel has been introduced. This is expected to generate Rs 45 billion per year. Half of it is earmarked for the National Highway Development Fund. We consider this a positive step towards improving the quality of roads.

Separate paths for cyclists and pedestrians can promote cycling and walking. Facilities may be created in local trains and public transport buses to carry bicycles, so that people can use them in conjunction with mass transport modes. Finally, time of day pricing of road and parking space can encourage greater efficiency in its utilization. Singapore and New York are cities which have experienced the effectiveness of these economic instruments.

POWER SECTOR REFORMS

Inadequate supply of power continues to plague the Indian economy. Shortages in peak power capacity and energy over the past five years are estimated to be around 20 per cent and 8 per cent respectively. For want of resources, during the Eighth Plan, we added only 16,000 megawatts (MW) as against a lowered target of 31,000. In March 1998, we had an installed capacity of only 89,166 MW. In 1996–7, the rate of return on capital of the state electricity boards (SEBs) was –17.7 per cent. These problems are addressed in Chapter 7 by Anjana Das, Jyoti Parikh, and Kirit Parikh.

Why does Power Shortage Persist?

As was pointed out in the India Development Report (1997), the root cause of power shortage is the financial sickness of SEBs, which are forced to subsidize agricultural and domestic consumers. As a result, all of them make losses and are sometimes unable to pay for the coal or power they purchase. This leads to a paucity of resources for investment.

The subsidies have been increasing. In 1996–7, the total subsidy of SEBs was Rs 180 billion of which Rs 138 billion were for agriculture and Rs 42 billion for domestic consumers. While some state governments explicitly provide budgetary support to SEBs for these subsidies, these added up to just Rs 24 billion in 1996–7. If power were not sold at a discount, the SEBs would have had Rs 150 billion of additional funds. Leveraged in financial markets, this would have been enough to set up 10,000 MW a year and also provide for needed expansion in the transmission network.

Instead of facing up to this problem, the government has concentrated on attracting independent power producers (IPPs). Within six months of signing the first Enron deal in 1993, some 240 offers were made to various SEBs by private parties willing to set up generating plants. Yet by 1998, only four plants with an installed capacity of 1346 MW were operating.

Why has Private Power not Taken Off?

Private companies like the Tata Electric Company, the Ahmedabad Electricity Company, and the Calcutta Electric Supply Corporation have been in existence since before Independence. They operate as licencees of the SEBs and are involved in power generation and distribution. However, a fresh initiative began in the early 1990s to involve the private sector in power generation. The GOI allowed the private sector to set up generating stations and sell power to the SEBs. The Electricity Supply (ES) Act was amended to permit private generators to enter the arena. Under the legal provision, the agreement between a private generator and the SEBs would be a purely commercial agreement with only certain technical parameters to be prescribed by the Central Electricity Authority (CEA).

The private sector responded enthusiastically. By the end of September 1996, private companies proposed to set up 265 projects totalling 63,238 MW of generation capacity and investment worth Rs 2.29 trillion. In addition, foreign companies intended to invest Rs 0.97 trillion to set up fifty-five power projects with a generating capacity of 26,668 MW (CMIE, 1996). Yet, as already noted, only four plants with a total capacity of 1346 MW were operating as of September 1998.

When the sole buyer is a financially sick SEB, an independent power producer (IPP) will remain uncertain if its bills will be paid. It would want a counter-guarantee from the central government. The counter-guarantee route is a dangerous one for the central government. If 20,000 MW are given counter-guarantees, and all states go into default (a scenario which is less improbable than it appears), the central government would have to spend $ 10 billion a year. If private producers were allowed to sell electricity directly to consumers, they would not need counter-guarantees. However, as they would take away the best industrial customers, the SEBs' financial sickness would increase unless tariffs are reformed.

The middle road, which can be adopted right away, is that IPPs be permitted to sell directly to customers but a cess imposed on their sales be given to the SEB to meet its social obligation. The same should be done for captive power plants by industries. Under this condition, however, private or captive power is unlikely to be significant. In this sense, reform of the SEBs is important even to attract IPPs.

Power Sector Reforms, Initiatives, and Prospects

Reforms have been initiated in three directions, namely SEB reforms, facilitation of IPPs, and promotion of mega power projects.

Regulatory bodies are required to provide a level playing field to all generating firms, to reduce system costs, and to protect consumer interests. A Central Electricity Regulatory Commission (CERC) has been created to set tariffs and regulate interstate power exchange, licensing, planning and other functions for all central generation and transmissions utilities. It is also expected that each state will set up a State Electricity Regulatory Commission (SERC) with statutory powers to set tariffs. A number of states are planning to set up SERCs. To balance the interests of consumers and suppliers, Central and State Regulatory Commissions need to function in a transparent and accountable manner.

The awarding of power projects to the IPPs was started as one-to-one negotiation through a memorandum of understanding (MOU), based on guidelines on technical parameters from the CEA. The problems with the MOU route and CEA guidelines are dramatically illustrated by the Enron episode. The main problem with the CEA guideline was that it was a cost-plus formula in that it provided a guaranteed return without any control to ensure that capital cost was minimized (Parikh et al., 1997).

Since February 1995, competitive bidding has been adopted for awarding power projects. This process has also led to certain problems. Although, in principle, competition lowers price, this approach requires sound reputation and past records for the bidding parties. The Indian experience so far shows mixed or negative results. Several states that went in for competitive bidding ended up awarding projects to promoters without previous experience in the power sector. They bid low prices but when the project was awarded they could not obtain financing. Many of these projects are still on paper. One way to address this problem is to require significant collateral for participation in bidding, so that frivolous bids are discouraged.

To explore the advantage of economies of scale associated with large thermal power plants, the Ministry of Power (MOP) decided to consider 'mega projects' with a capacity of 1000 MW or above, for supplying power to more than one state. A number of foreign governments showed interest. These projects can be awarded through government-to-government negotiations instead of competitive tendering. Guidelines for this process were framed by a committee led by a former Chief Justice of the Supreme Court. The ministry aims to add 5000 MW via this route. A policy on mega projects has been announced in October 1998.

COAL, OIL, AND GAS

Fossil fuels are dealt with in Chapter 8 by Anjana Das, Jyoti Parikh, and Kirit Parikh. Since 1947, the Indian energy sector has grown under public investment and management. From the Sixth to the Eighth Five Year Plans, budgetary support for this sector was in the range of 27–30 per cent of total plan outlay. An environment of protection, monopoly, and lack of hard budget constraint gave public sector companies few incentives for efficiency. Subsidized energy prices gave consumers incentives to waste energy.

Roughly a quarter of the total energy consumption in India is met through imports. From the macroeconomic perspective, the objective of energy policy is to obtain the desired supply of energy at minimum possible cost.

India's fuel policy has sought to meet many objectives; this has led to a pricing regime that is riddled with inconsistencies. For example, a single price prevails all across the country for an oil product through freight equalization but the price of coal is not equalized. Petrol is taxed heavily compared to diesel, which may be justified if one wants to discourage use of private motor vehicles, but the proliferation of diesel cars has defeated this end.

By the late 1990s, it was recognized that state-owned energy companies were neither in a position to generate the requisite resources internally nor would they be able to tap the domestic capital market. Mobilization of resources from the private sector became imperative, and this called for a different policy environment.

The Coal Industry: What has Reform Accomplished?

The main problems in the coal industry are poor quality coal, uncertain supply, and irrational pricing. Some of the recent measures such as price decontrol, liberalized import, and limited privatization have made a difference to some extent. Coal India Limited (CIL), the major public sector coal producer, increased its profits by 86 per cent in 1996–7, the first year of partial decontrol of prices, by raising prices by 30 per cent. Import liberalization provided some competition at the same time. Imported coal is often cheaper at coastal sites. For example, in Chennai, Indonesian coal costs Rs 286 per million Kcal while coal from Bihar costs Rs 381.

What should Our Coal Policy be in the Context of Climate Change Concerns?

International concerns about global warming are generating pressures on India to reduce emissions of greenhouse gases. India cannot do without coal, the only abundant mineral energy source. However, per capita carbon emissions in India are only 0.28 tonne per annum compared to 5.6 tonnes for the USA. If the whole world were to emit as little as an average Indian, there would hardly be a problem. The climate change problem is not of India's creation and we should not bear any burden on that account.

What are the Problems in the Petroleum Sector?

The main problems in the petroleum sector are low, almost stagnant, production of domestic crude, high cost of domestic transport, and a distortionary pricing policy. Crude production reached 33.7 metric tonnes (Mt) in 1989, had dropped to 27 Mt by 1993–4, and is now 33.8 Mt in 1997–8. In 1997–8, around 35 Mt of oil and 22 Mt of products were imported. Total refining capacity as of March 1998 was 62 Mt.

Of the 26 sedimentary basins in India, only 6 have so far been explored, accounting for only 30 per cent of the country's prognosticated reserves. By 2000, the production from existing fields is expected to stabilize at about 40–4 Mt. Meeting the projected demand of 197 Mt in 2010 would require large imports.

India's oil sector depends heavily upon railways for transportation, which is ten times costlier than transport through pipelines. An Oil Industry Working Group has recommended that fourteen new pipelines be constructed by 2005.

The consumer prices of petroleum products are set by the government through an administered pricing mechanism (APM). Till recently, the crude producers, ONGC and OIL, got a 15 per cent post-tax return and refiners got a 12 per cent post-tax return on capital employed. The difference between the consumer prices and supply cost is absorbed by an oil pool account. This account shows a surplus or deficit depending on the world price of oil products and levels of consumer prices. The oil pool deficit has flipped from a deficit of Rs 155 billion in 1996–7 to a surplus of Rs 170 billion in 1998–9, owing to easy world oil prices.

Domestic consumer prices of petroleum products differ significantly from international prices as the government subsidizes some products (kerosene, cooking gas) and taxes others (petrol). These pricing distortions have led to adulteration, diversion, and inefficient use of products. The low price of diesel has encouraged the use of capital-intensive diesel cars. Such arbitrage has led to a sharp rise in subsidies: the total subsidy on diesel in 1996–7 has jumped nineteen times from the 1994 level. The wholesale price for kerosene rose by only 47 per cent from 1981 to 1997, while the price of petrol rose by 180 per cent during the same period.

How to Increase Domestic Crude Supply?

We need additional investment in exploration and production of crude oil. Our efforts to secure effective participation by private firms have not been too successful partly due to the quality of fields offered for exploration and partly due to the requirement of sharing production with national oil companies. The new exploration licensing policy which provides a level playing field to private firms with the national oil companies, 100 per cent private ownership and freedom to market the products, is expected to attract private explorers/developers.

What is the Progress on Dismantling the APM?

The need to dismantle the APM was felt strongly in 1996–7 when the oil pool deficit reached Rs 155 billion. In November 1997, the GOI decided upon a complete dismantling of the APM in a phased manner beginning 1 April 1998 and ushering in a market determined pricing mechanism by 2001.

The policy provided international prices for domestic crude with a floor price of $ 12/barrel, abolition of retention price scheme for refineries from April 1998, decontrol of imports, marketing rights to large private oil producing and refining companies and reduction of import duties. During April-August 1998, prices of decontrolled products like naphtha, bitumen, furnace oil, and LSHS were revised twice and reduced by 8 per cent, due to consistent fall in international prices.

These liberal initiatives only extend till the refinery. The sales and distribution of petroleum products are still operated through the oil pool account. To create effective competition, a transparent pricing method is required for all segments. Given the huge resource requirements for developing a national pipeline network, development and operation of pipelines should be opened to the private sector.

Finally, we should explore and develop international basins. ONGC Videsh Ltd (OVL), a wholly owned subsidiary of the ONGC, carries out overseas activities. Much more aggressive efforts are required. Indian national and private companies need substantial support from the government.

Natural Gas, Liquefied Natural Gas, and Coal based Methane

The share of natural gas in total energy supply has increased from 2 per cent in 1980 to 8 per cent in 1995. The balance recoverable reserves were about 707 billion cubic metres (bcm) in 1995–6. Currently, as against the production of 24.45 bcm, domestic demand is 32 bcm. The excess demand reflects its low price. Till recently, gas price was administered. However, recognizing that natural gas and petroleum products are substitutes, the deregulation of natural gas pricing should be undertaken concurrently with crude oil and petroleum products.

In view of the growing gap between demand and supply, the government is considering the possibilities of importing piped gas or Liquefied Natural Gas (LNG) from the Middle East and of exploitation of domestic Coal Bed Methane (CBM).

The cost of LNG for plants near ports (excluding fuel taxes and infrastructure charges) could be $ 3.5/MMBTU as against $ 2.05/MMBTU for imported coal. The landed cost of domestic coal, on the other hand, at a thermal power plant of the Maharashtra State Electricity Board has been worked out at $ 2.74/MMBTU.

POLITICAL ECONOMY OF THE REVENUE DEFICIT

There is wide agreement that the revenue deficit should be cut. However, the problem persists. Why have successive governments failed to deal with this? In Chapter 9, Ashima Goyal examines the political economy underlying revenue deficit. The standard explanation is that concessions demanded by and granted to vested interests are responsible for the steady decline in the government's financial position.

Has the Revenue Deficit Grown because of Vested Interests?

An examination of the time series of disaggregated government budget data is revealing. The major surprise is that government consumption expenditure as a ratio of the GDP was almost the same in the mid-1990s as it was in the mid-1970s. It is the interest payments component of current expenditure that has risen. Since the 1980s the government has not been able to fund its current expenditures from current revenues. This led to a cumulative rise in public debt, interest payments, and therefore revenue deficit. Although investment has been cut the most, government consumption has also suffered. The ratio of the purchase of commodities and services in 1995–6 was about the same as in 1970–1. The ratio of compensation of employees to GDP in non-departmental enterprises fell in the 1990s, and has been stagnating since the mid-1980s while the ratio of operating surplus to GDP has continued to rise. It is in the early 1970s that both current and consumption expenditure of government administration peaked, and savings showed a trough.

This could imply that vested interests within the government and the public sector have not been strong enough to protect their share; this would imply that they are not fully responsible for the decay in government finances.

What Led to Revenue Deficits?

A different set of political compulsions seems to have led to the growing revenue deficits. It seems that governments in the past, whenever they have faced a supply shock such as a drought or an oil shock, have failed to adjust prices. This may be motivated by a desire to shield 'poor voters' from higher prices. The prices of a large variety of public goods and services were fixed over the years, leading to a lowering of quality and investment in the production of public goods.

Are these Subsidies Sustainable or Have They Become Self-defeating?

Fiscal deterioration has been the result of the above-mentioned facts, together with rise in borrowing after the period of major cost shocks, the inability to raise taxes, and widespread fall in the quality of public services.

Even private firms under price controls, in the presence of cost shocks, would have incentives to lower quality and investment. For India's public sector, the indifference to quality and customer concerns was aggravated by lack of investible surplus. The consumers, who were the intended beneficiaries of price control, themselves suffered from inadequate supply and poor quality of public goods. Outcomes in power, telecommunications, railways, roads, and education show how low prices have led to a fall in the quality and availability of services. Gross subsidization has become untenable and revenue losses have mounted as the rich have turned to private providers. It has become difficult to service the poor adequately.

A concerted attempt to rationalize user charges, improve quality, and boost human and physical capital can bring about great improvement. Fiscal reform should be systematically designed to remove incentives for wastage, and non-discretionary and non-distorting methods of protecting the poor should be adopted.

INDIA'S PUBLIC FINANCE: THE ISSUES

As important as cutting government expenditure is raising resources. The core issues of public finance are addressed by Raghbendra Jha in Chapter 10. The government collects the bulk of its revenue from indirect taxes, namely excise, sales tax, and customs. In 1998–9, excise, customs, and income (including corporate) taxes constituted 33.9 per cent, 34.2 per cent, and 30.9 per cent respectively of the central government's total tax revenue. Sales tax was 41.6 per cent of state tax revenue.

A tax on a commodity raises its price and lowers its demand. So there is a loss in consumer welfare. This loss is greater than the revenue that the government collects. The difference in welfare loss and tax revenue, called deadweight loss, is associated with all indirect taxes. Moreover, when taxes on different commodities differ, they change relative prices which also has an impact on welfare. The tax structure should be carefully designed to optimally balance the loss in welfare of different groups in society and the government's need to raise revenues to finance expenditures which aim to raise social welfare.

Direct taxes such as personal income tax and corporate taxes also cause distortions in effort, activity levels, savings, and investment allocations. In India's federal system, the taxes imposed by different states can affect trade between economic agents located in different states and the location of economic activity.

These raise a number of questions for tax policy and public finance.

What is an Optimum Tax Structure?

An optimal tax structure has four desirable features:

- Tax revenue should be collected in the best manner possible, i.e. with least burden on the tax payers.
- The amount of tax revenue collected should be related to the perceived benefits of public expenditure.
- The deficit of expenditure over tax revenue should not grow without bound, so that the government remains solvent even in the long term. Tax assignment between central and state governments is proper in the sense of minimizing the tax burden and overlaps, and ensures that each level of government puts in optimal effort in tax collection.
- Taxes in different states should not throw up barriers to exploiting 'gains from trade' within India.

Is India's Tax-structure Optimal?

The present tax structure in India is defective in many ways. Specifically, the share of direct taxes in total tax revenue is too low and should be raised. Among direct taxes, the share of personal income tax should increase and corporate tax should fall. Income taxes should be levied on all income. The number of tax slabs should be small and the rate of progression should be mild. The excise and customs duties are far from optimal.

The tax system is riddled with complexity and exemptions. This complexity leads to loopholes, wasteful expenditures (for the economy) on accountants and lawyers, harassment and corruption in enforcement, low tax collections, distortions to resource allocation, and political efforts by pressure groups to obtain tax breaks. A good case can be made for eliminating most exemptions and special cases in the existing tax codes.

The budget proposals made in February 1999, which have reduced the number of excise slabs to 3 and customs slabs to 5, are steps in the right direction. There are enormous opportunities for simplification and elimination of exemptions for income tax and corporate tax.

How should the Tax Structure be Reformed?

Properly harmonized VAT (value added tax) structures between central and state governments should be designed. There should be a single rate VAT, with additional taxation for polluting industries. The VAT should replace all commodity taxation. Its administration should be simplified and there should be tax-payer education.

Local taxes like the octroi that hinder the free flow of goods should be scrapped. More generally, all restrictions on the free flow of goods within the boundaries of the country should be scrapped. The level of non-merit subsidies should be reduced. Those that are offered should be appropriately targeted.

The expenditure policy should aim for an appropriate mix of expenditure reduction and expenditure switching. The capital component of expenditure should go up and the revenue component should be reduced.

TAX EVASION, AMNESTY SCHEMES, AND BLACK INCOME

Reducing the incidence of tax evasion is a central problem of India's public finance. The recent Voluntary Disclosure of Income Scheme (VDIS) has brought amnesty schemes into prominence. Chapter 11, by Shikha Jha, addresses these problems.

What is the Incentive to Evade?

A taxpayer has an incentive to evade if it is financially worthwhile to do so. Given that it is costly for the tax authority to find out the true tax liability, the probability of getting caught is small for an evader. Thus only under exceptional circumstances can full tax compliance be expected. By and large, tax compliance would improve if tax rates are reduced or penalties increased. Compliance can also be increased if taxes are enforced with an optimal penalty structure. An appropriate method of dealing with the problem is to have sensible tax policies to curb tax evasion, and effective policing of illegal activities.

Apart from an emphasis on basic structural reforms, sensible tax policies include reduction of marginal income tax rates on individuals, firms, and corporations. Reduction of tax rates, and hence incentive to evade, could help widen the tax base. Thus the net effect of this policy need not necessarily be a reduction in revenue. Evidence shows that higher taxes on incomes, profits, and capital gains have a negative influence on economic growth. For example, higher rates would tend to discourage work effort and lead to inefficiency in the choice of labour which could have a negative impact on the growth rate of the economy.

What are the Implications of Amnesty Schemes?

One of the major problems faced by the government in raising tax revenues is the narrow tax base. Only 14 million people pay income tax in India and income tax collection is only 2.7 per cent of the GDP. It is widely recognized that many who should, do not pay income tax and that there is widespread tax evasion. To raise revenue, governments have offered amnesties from time to time.

While amnesty schemes generally add to current revenue, they can also have implications in terms of future revenue generation, future tax base, and taxpayer behaviour in the presence of amnesties. Expectation of a future amnesty scheme leads to continued tax evasion. By allowing tax evaders to evaluate their assets at prices prevailing several years ago, such schemes are perceived as being unfair to the honest taxpayers that bear relatively greater tax burden. These adverse compliance effects of amnesties or falling penalty collection could even outweigh direct gains from an amnesty.

As many as ten different amnesty schemes have been introduced since 1951, with a greater frequency of schemes in recent years. Although the success of amnesty schemes has been judged by the amount of revenue realized during the year of the scheme, there has been a negative influence on tax compliance. A study, using aggregate data for 1965 to 1993, finds that only the 1975 amnesty appears to have had a positive impact on revenue while others had negligible or even negative effects. Declarations in the VDIS (e.g. in 1997) have been mostly in terms of unproductive assets. A study based on panel data from Tamil Nadu during 1982–94 finds that amnesty, bearer bonds, and voluntary disclosure schemes reduce the credibility of the tax system. The effect is enhanced by weak detection and penalty process.

What are the Implications of Black Income Generated through Tax Evasion?

Tax evasion not only leads to revenue loss for the government, it also generates black income, which further erodes the tax base. Thus checking tax evasion is important not only to raise revenue and reduce fiscal deficit but also to curb black income generation. Illegal activities other than evasion also provide avenues for black income generation. The prevalence of a black economy implies some transactions, such as those in the property market, are made with black money. This leads to the generation of more black money. But while it is generally contended that black income leads to wasteful expenditures and encourages conspicuous consumption, it is not clear if such a tendency necessarily has negative consequences for welfare. For example, in certain situations, it could boost effective demand in the economy.

If insights were obtained into the process of black income generation, an attempt could be made to curb the associated illegal activities. Even if such activities cannot be curbed, at least an idea of the magnitude of the black economy would be useful to estimate the true level of national income. But empirical evidence suggests that estimating black money can be a very tedious task, often leading to inaccurate estimates. In the Indian case, Acharya et al. (1985) argued that tax-evaded income provides a significant proportion of actual black income and, if estimated correctly, can give a clue to the size of the black income generated in the system. If the growth of the black economy has been the same as that of the white economy and black income forms roughly 20 per cent of GDP as estimated by Acharya et al., tapping even a third of this income through better tax compliance will fetch the government 2 per cent of GDP. This can be used to reduce fiscal deficit from, say, 6 per cent to 4 per cent of GDP.

INDIA'S EXPORT COMPETITIVENESS

The basic intuition of economists regarding problems of trade does not attach much importance to 'competitiveness'. Even if country A is less efficient than country B in producing all goods—owing to problems such as poor infrastructure, unskilled labour, and high interest rates—there are major avenues for both countries to benefit from trading with each other. The role of the exchange rate is only to find the point at which exports and imports equalize.

Such an equilibrium exchange rate could involve very low wages and incomes in a country if productivity in the country is poor. The basket of goods that is exported or imported is greatly influenced by acquisition of skills and technology. In this manner, technological change and productivity growth have a major impact upon exports. Chapter 12, by A. Ganesh Kumar and Rajendra Vaidya, reviews the performance of Indian industries.

We can examine the competitiveness of Indian industries by looking at their comparative advantage, as revealed by their export performance. If a country's export share in the total global exports of a commodity increases, we might think that the country is competitive in that commodity. Such an increase might be due to an undervalued exchange rate that would be reflected in the exports of other goods as well. If a commodity's export share in total global exports of that commodity grows faster than the country's overall export share in total global exports, then we can say that the commodity is gaining competitiveness. The picture that we find at the sectoral level is rather bleak with India not being competitive in a large number of sectors and losing competitiveness in some. Only in about 46 commodities examined, out of a total of 404 commodities examined, is India gaining competitiveness.

How can Export Competitiveness be Improved?

Productivity growth and technological upgradation require investment in technology and human capital. In this context, the efficacy of the financial sector in allocating resources to efficient industries and firms therein comes into question. Here we find an optimistic picture in which the financial sector reforms undertaken so far have had the desired effect of allocating resources to more efficient firms. Exporting firms with a proven record in fiercely competitive international markets are treated favourably by capital markets. They face lesser finance constraints than firms that operate mainly in domestic markets that have been largely protected. Thus the financial markets have successfully offered an enabling environment for exporting firms to grow.

What can the government do to improve productivity, upgrade technology, and enhance the delivery capacity of the country? The government needs to ensure that firms do not thrive merely on protected domestic markets but operate in a competitive environment that forces them to strive for productivity improvements. This calls for trade liberalization that exposes Indian firms to greater competition from foreign firms; encourages exit in sectors where the country is not competitive and encourages entry to only take place where there exists competitive advantage. Simultaneously, the government should also make it easier for Indian firms to operate and expand. Many of the bureaucratic controls at the central, state, and local levels that plague the economy should be done away with so that firms are better able to concentrate their resources and efforts in building their competitive strengths. These should be complemented by an all round systemic improvement, especially in key infrastructure industries such as power, roads, railways, and ports to improve the delivery capacity of the country as a whole.

EXPORTING IN A GLOBALIZED ECONOMY

While international competitiveness, exchange rate, and macroeconomic stability are essential for export growth, international linkages of industrial firms and production are also important. The advent of global markets and integrated international production has direct consequences for India's exports. These aspects are dealt with by K. V. Ramaswamy in Chapter 13.

How Important is Global Production Sharing?

Globalization, the integration of domestic economies with the world economy through trade, is reflected in the rising share of international trade in world output. Each 10 per cent increase in world output has on average been associated with a 16 per cent rise in world trade, and the pace of global integration has been mainly driven by the manufacturing sector. The relatively new aspect that makes globalization different from earlier stages in the international division of labour is the ability of producers to break up production processes into several geographically separated steps. A good is produced in a number of stages in a variety of locations, adding value at each stage. This process of 'slicing up the value chain' provides greater room for developing countries to specialize in the labour-intensive stages of the manufacturing process of a commodity, which as a whole might be capital intensive. It is important to recognize that in the global economy, economic activity is not only international in scope, it is also global in organization.

Three important factors contributed to the process of globalization. First, world trade and investment barriers fell rapidly in the 1980s and early 1990s, under the successive rounds of GATT negotiations. Developed country tariffs on industrial products will fall to the astonishing level of 4 per cent (on average) under the Uruguay round. Second, there has been a dramatic decline in transportation and communication costs. The per minute cost of international phone calls fell by 4 per cent per year in developing countries (though not in India) in the 1990s. Third, the role of knowledge (technology) and other intangible assets (trademark or brand name) became crucial and of strategic importance in world production. The new logic is to supply every national market by sourcing from whichever country in the world is able to ensure efficient supply.

The importance of the phenomenon of global production is evident from the following facts:

- Cross-border production by affiliates of multinational enterprises (MNEs) as a share of world manufacturing output rose from 12.7 per cent in 1982 to 17.6 per cent in 1992.
- Over the period 1986–9 outflows of FDI have risen more rapidly than world trade (WTO, 1995).
- The share of exports in sales of US majority owned foreign affiliates in developing countries doubled between 1982 and 1993, reflecting the increasing importance of intra-firm trade, that is trade within MNEs, between parents and affiliates, or between different affiliates.

What is the Nature of Global Production Networks?

Two alternative modes of organizing international production networks can be distinguished: producer driven commodity chains (PDCCs) and buyer driven commodity chains (BDCCs). PDCCs are found in those industries in which large, usually transnational corporations (TNCs) play the central role in coordinating production networks, including their backward and forward linkages. This is characteristic of capital- and technology-intensive industries such as automobiles, aircraft, computers, semiconductors, and heavy machinery. BDCCs are found in those industries where large retailers, branded marketeers, and trading companies play the key role in setting up decentralized production networks in developing countries. This is common in labour-intensive consumer goods such as garments, footwear, toys, and consumer electronics.

The East Asian Newly Industrializing Economies (NIEs) became successful exporters in the late 1960s and 1970s, primarily by mastering the dynamics of BDCCs. Apparel was a leading export sector for each of the four East Asian NIEs, namely Hong Kong, Singapore, South Korea, and Taiwan. Similarly all the countries except Singapore exported toys and South Korea and Taiwan also exported footwear. East Asian firms became full range package suppliers for foreign buyers. Today China is the foremost volume exporter of low-tech consumer goods.

What Kind of Export Roles can Indian Industry Assume in the Global Economy?

The linkages with the global economy can be viewed as connected through the following four export roles: (1) export processing assembly operations, (2) component supply subcontracting, (3) original equipment manufacturing (OEM), and (4) original brand name manufacturing (OBM). The mastery of each export role demands distinctive resources and capabilities. They represent systematic upgrading of the economy's industrial and technological capability.

The NIEs of both East Asia and Latin America have been engaged in this kind of labour-intensive production. Countries like Mexico, which has the world's largest export-processing sector with 800,000 employees, have extended the benefits of export processing zones to all export-oriented firms, without requiring them to be located in the special zones. China has set up special economic zones (SEZs) within which all economic activities—manufacturing, banking, export and import, and foreign investment—take place in a more liberal environment. Duty exemptions for assembly type operations, combined with rapid processing of imported inputs and materials by custom authorities, made significant contribution to China's export growth. Much can be learned from the East Asian experience in the electronics industry. Firms gained entry by learning by OEM, secured a market channel, and acquired technology. Explicit focus on export markets and the most demanding buyers enabled them to overcome late comer disadvantages.

India has greater opportunities to assume and develop the export role of assembly, component supplier, and OEM exporter. The main avenue to enter international networks is through FDI. Cross-country studies of FDI indicate that infrastructure quality, labour cost, and domestic market size are predominant factors that influence international investors *vis-a-vis* short-term incentives like corporate tax rebates. India has the advantage of a large domestic market but critical problem areas are in infrastructure and labour productivity. Labour costs are rising in South Korea, Taiwan, Indonesia, and Singapore. Foreign investors from developed countries would be looking for cheap labour cost locations with macroeconomic stability. If India could improve its infrastructure and provide for a relatively liberal economic environment, similar to that in the SEZs in China, we would be able to attract a large amount of FDI from western as well as East Asian countries.

Our study of India's garment exports, a buyer driven commodity, reveals the absence of structural change and policy reforms. Buyers in world markets are expecting more services in terms of minimum performance standards. Delivery and service emerged as the main weaknesses of Indian exports as perceived by importers in the EU, Japan, and the US. Access to imported inputs, shipping facilities, and proximity to fabric sources have become more important determinants of out-sourcing by foreign firms than mere manufacturing capability. Policy makers should remove two major impediments to investment: product reservation and foreign investment restrictions. This would facilitate the entry of large domestic and foreign firms into the garment industry. The reform would enable the garment industry to develop capabilities to face the challenge of competition in the global market.

Globalization is not a simple process of interacting with world markets at arm's length market transactions. Countries are incorporated in the global economy through a network of human linkages, international production, trade, and finance. The key to success in the international market place seems to be the attitude 'I will make what you need' and not 'I will sell what I make'.

CORPORATE GOVERNANCE AND SHARE OWNERSHIP

The main goal of economic reforms is rapid economic growth. To attain this, the reforms rely on efficient utilization of resources by private firms. But what ensures the efficiency of firms? The extent to which firms reach for high levels of efficiency is greatly influenced by the manner in which they are governed.

Corporate governance deals with the ways in which suppliers of capital exercise control and ensure accountability of company management, so as to assure themselves of getting the best possible return on their investment. The need for such monitoring arises because the objectives of debt and equity holders are not generally shared by the managers who operationally control the company. This new field is the subject of Chapter 14 by Jayati Sarkar and Subrata Sarkar.

The following questions arise in the study of corporate governance: (i) How do equity holdings by different types of shareholders, i.e. directors and relatives, corporate bodies, foreign investors, financial institutions, and institutional investors like mutual funds and insurance companies, influence company value? (ii) Does the effectiveness of a particular type of shareholder in influencing company value depend on the extent of its shareholding? (iii) Is the effectiveness of financial institutions in corporate governance reinforced by the fact that these institutions are also major suppliers of debt?

(iv) Which is more effective in governance, equity or debt? The chapter deals with these questions.

Does the Identity of the Shareholder Matter?

To what extent have different equity holders and debt holders been effective in the governance of Indian firms? Effectiveness can be measured in terms of the ability of financiers to increase company value. At low levels of stake, managers may take actions which benefit themselves at the cost of shareholders. As their stake increases, their power to take such actions also increases. However, beyond a certain threshold, their interests coincide with shareholders' interests.

Company value can be taken as the Market to Book Value Ratio (MBVR) which is defined as the ratio of market value of equity to book value of equity and reserves. Commonly, MBVR is referred to as the price to book value ratio or the P–B ratio. The market price of the share reflects the sum of discounted cash flows that the holder of the share expects to get, after paying the dues of all other claimants of the company, by holding the share forever. The book value of the share reflects the cost at which the share was bought. Thus the P–B ratio summarizes the lifetime return from holding the share and is a good measure of company value from the viewpoint of a shareholder.

Analysis of Indian company data indicates that company value is low when promoters have a low stake in the company. As promoters' stakes increase beyond a threshold, there is a positive effect on company value. This suggests that the recent debate regarding the consolidation of promoters' stake in companies through routes like creeping acquisitions and buy-back of shares should be resolved by looking at the post-acquisition stake of the promoters. They should be encouraged to increase their stake beyond the threshold level observed in our analysis which is around 24 per cent. For companies where promoter stakes remain below their threshold, regulators need to be watchful.

The role of corporate bodies in the governance of companies portrays a similar non-linear relationship—company value increases with corporate shareholding beyond a threshold. However, the effect of corporate holdings on company value appears to be much stronger than it is for promoters' holdings. In this light, the recent liberalization of norms for intercorporate investments does have some merit.

The role of financial institutions confirms the popular wisdom among policy analysts these days that these institutions should be actively involved in governance through nominee directors only in companies where they have sufficient stakes. Data show that even way back in 1995–6, when the general perception was that financial institutions were by and large passive even in companies with substantial stakes, their presence positively impacted company value. On the other hand, the impact of institutional investors, primarily the Unit Trust of India (UTI), as reflected in our analysis, leaves more to be desired. The success of CalPERS, which is a public employee pension fund in the US, is often cited as an example of an active institutional investor which has spearheaded many governance reform campaigns in companies where it has substantial stakes. In this context, the recent active stance formally adopted by the UTI in closely monitoring the performance of high profile firms, and in supporting the takeover of weak companies, is obviously welcome.

How do Takeovers Affect Corporate Value?

The recent proposal of allowing a 'cooling period' of 5 to 10 years for first generation promoters to prevent being taken over by large corporate predators, may compromise the interests of minority investors in companies with low promoter stakes. An inverse relationship between director holdings and company value is observed in such companies. Further, the current provision of requiring the permission of the target company's board in case of takeover bids by foreign companies is unduly protective towards incumbent management. This provision fails to hold the board accountable for the under-performance of the management whose inefficiency could have triggered the hostile bid in the first place.

The Importance of Disclosure

Finally, the importance of the disclosure of information regarding performance of companies should be emphasized. There are grounds to believe that accounting information does not necessarily reflect the true worth of the company. The adoption of International Accounting Standards by Indian companies and the strengthening of auditing procedures through the formation of audit sub-committees would help ensure the disclosure of comparable, consistent, and complete information.

THE INSURANCE SECTOR

Chapter 15, by Ajit Ranade and Rajeev Ahuja, examines the problems of India's insurance sector.

The life insurance sector was nationalized in 1956 into the Life Insurance Corporation (LIC) and the non-life insurance sector was nationalized in 1972 as the General Insurance Corporation (GIC). Due to concerns of (a) relatively low spread of insurance in the country; (b) the efficiency and quality of functioning of the public sector insurance companies; and (c) the untapped potential for mobilizing long-term contractual savings funds for infrastructure, the (Congress) government set up an Insurance Reforms Committee in April 1993. The Committee submitted its report in January 1994, recommended a phased programme of liberalization, and called for private sector entry and restructuring of the LIC and GIC. An insurance bill was moved by the United Front government but it did not pass. The BJP government moved an insurance bill again in 1998, which had also to be referred back to a select committee of parliament.

How Important are Insurance Sector Reforms?

A well-developed insurance sector promotes economic growth by encouraging risk taking activity, and has great potential as a mobilizer of long-term contractual savings in the form of life insurance. The latter would help assist infrastructural development.

Commercialization of infrastructure provisioning has become an economic reality. Government estimates for infrastructure investment are about Rs 12 trillion over the next ten years. Most of this will have to be financed through domestic long-term contractual savings, and not foreign sources. The current mobilization of such funds through life insurance and provident and pension funds is only about Rs 100 billion per year. Long-term contractual saving institutions, because of their long-term liabilities, are natural investment fund channels for long gestation infrastructure projects. These institutions can also play a major role in vitalizing the securities markets. As it stands now, the LIC is required to park 75 per cent of its investible funds in government securities. Of the remaining 25 per cent, only about 10–20 per cent goes into equities. In a liberalized regime, investment norms will have to give more autonomy to insurance companies, while maintaining their solvency.

How Big is the Insurance Market?

Insurance is a Rs 400 billion business in India, and together with banking services adds about 7 per cent to India's GDP. Gross premium collection is about 2 per cent of GDP and has been growing by 15–20 per cent per annum. India also has the highest number of life insurance policies in force in the world, and the total investible funds with the LIC are almost 8 per cent of GDP. Yet more than three-fourths of India's insurable population has no life insurance or pension cover. Health insurance of any kind is negligible and other forms of non-life insurance are much below international standards.

That there exists a vast insurance potential in the country is evident from low insurance penetration and insurance density. To tap this potential and to mobilize long-term savings we need reforms which include revitalizing and restructuring of the public sector companies, and opening up the sector to private players.

An important regulatory issue concerns the structure of industry, i.e. should it support a large number of competing, possibly small firms or a few large firms? Should insurance be fully competitive?

Empirically, the insurance industry in various countries shows a relatively high concentration, particularly in the life insurance business. While a few large firms may, by colluding, resort to monopolistic practices, a large number of firms may lead to unbridled competition which also is inimical to the insurance business, as it leads to insolvencies. A healthy market structure is one that checks against both these tendencies and this can be ensured through a proper regulatory mechanism. This is one of the briefs of the Insurance Regulatory Authority (IRA) which needs to be made a statutory body.

The IRA's role comprises the following three functions: (a) protection of consumers' interest, (b) to ensure financial soundness and solvency of the insurance industry, and (c) to ensure healthy growth of the insurance market.

Why Open up the Insurance Industry?

An insurance policy protects the buyer at some cost against the financial loss arising from a specified risk. Different situations and different people require a different mix of risk–cost combinations. Insurance companies provide these by offering schemes of different kinds.

The nationalized insurance industry has not offered consumers a variety of products. Opening of the sector to private firms will foster competition, innovation, and variety of products. It would also generate greater awareness on the need for buying insurance as a service and not merely for tax exemptions, which is currently done. On the demand side, a strong correlation between demand for insurance and per capita income level suggests that high economic growth can spur growth in demand for insurance. Also, there exists a strong correlation between insurance density and social indicators such as literacy. With social development, insurance demand will grow.

Opening up the insurance sector requires crossing at least two legislative hurdles. These are the passage of the Insurance Regulatory Authority (IRA) bill which will make the IRA a statutory regulatory body, and amending the LIC and GIC Acts, to end their respective monopolies. Successive governments in the past few years have been unable to implement these reforms, despite a general consensus on their desirability. Reforms in insurance are to be seen as an integral part of the ongoing reforms in the financial sector.

FINANCIAL SECTOR

The financial sector has to play a critical role in a liberalized economy. The East Asian crisis has generated a fresh set of concerns about the extent to which problems in the financial sector can have a significant impact upon growth and macro-stability. There are two aspects to these problems.

- The extent to which the financial system makes fundamentally unsound decisions when making choices amongst alternative projects.
- The consequences of failure of large financial intermediaries such as banks, mutual funds, and insurance companies upon macroeconomic stability.

The first question is linked to traditional concerns about allocative efficiency in the financial sector. The second question is about prudential regulation and methods for preventing failure.

These questions are particularly relevant in India, where we are in a transition away from a highly controlled economy to one with price flexibility. Price flexibility is synonymous with price risk, as profits and losses fluctuate with prices. These fluctuations are politically unpopular; they can generate a backlash against market-oriented reforms and they can lead to bankruptcy of fragile financial intermediaries.

What are the Recent Developments in India's Financial Markets?

In the India Development Report 1997, we examined the recent dramatic changes in India's securities markets. IDR 1997 had identified three important milestones in market development in the recent past, the onset of electronic trading, the transition from a market in Bombay to a truly national market, and the onset of robust functioning using the clearing corporation. It had offered a prognosis for the future in three important areas: (a) the onset of electronic settlement at the depository, (b) the rise of indexation, and (c) the onset of derivatives trading.

In the months that followed, one element of this prognosis has worked out very well: the onset of electronic settlement. The depository is now a reality in India's equity market, and for the fifty most important stocks in the country, 100 per cent of settlement is now done in dematerialized or 'demat' form. Hence the equity market now possesses modern institutions covering trading, clearing, and settlement. The next leap which the equity market is now ripe for is the transition to 'rolling settlement', which would finally bring India's equity market up to international standards.

The onset of derivatives trading has been repeatedly delayed through regulatory and legal hurdles, and lobbying by special interest groups. The Securities Contract (Regulation) Act has yet to be amended by Parliament, to enable derivatives trading to commence. Derivatives trading at an exchange can commence within weeks once this is done. This would be a major milestone for India's financial system.

India's equity market has seen profound institutional change over the period 1994–6. This has led to a new regime of market quality, including higher market liquidity and market efficiency. Applying some of the lessons from the equity market to improving the debt market should be a major goal of financial sector reforms in the months to come.

How should Risk be Measured?

We need to apply modern analytical tools of risk measurement and risk management. Risk measurement is better done using concepts such as 'Value at Risk' (VaR), which is phrased in terms of insolvency probabilities, rather than capital ratios. Financial derivatives are a central tool for risk management. These concepts, in the Indian context, are addressed in Chapter 16 by Susan Thomas and Ajay Shah, which also summarizes the state of the art in derivatives in India. The growth of the derivatives markets is a vital institutional vehicle to place economic agents in greater control of their risk exposure. Once firms are able to manage their own risks, and losing agents are less prone to look to the state for help, the government can push liberal policies even when they are volatility enhancing.

To implement modern tools for risk measurement, we need transparency and liquidity in markets. When assets are illiquid, or traded on non-transparent markets, it is hard to measure risk and to create derivatives markets. This aspect should serve as an additional impetus for us to build transparent and liquid markets in India. A financial intermediary, such as a bank, lending money to a firm by buying bonds which are traded on a secondary market is superior to the traditional privately contracted loan for a variety of reasons. Bond prices on a liquid market would reflect news daily, show an accurate valuation of the asset, and generate accurate perceptions about the risk of the loan. Finally, when bonds are traded on a liquid market, the intermediary gets greater flexibility in portfolio management as compared to the traditional loan where the lender is locked in.

What should the Goal of Prudential Regulation be?

Price risk is particularly dangerous for highly leveraged financial intermediaries. The typical bank finances Rs 100 of assets using Rs 10 of equity capital and Rs 90 of debt (i.e. deposits). This implies that bankruptcy follows from a loss of Rs 10 on the portfolio. To guard against bankruptcy, banks are required to meet 'prudent' norms. The existing paradigm of prudential regulation of banks, embodied in the Basle Capital Accord and endorsed by the Narasimham Committee, is based on the notion of capital adequacy ratio (CAR), where a minimum level of share capital is prescribed as a ratio of the risk weighted assets of banks.

Chapter 17, by Ajay Shah and Susan Thomas, takes a fresh look at these problems. It argues that the central objective of prudential regulation should be to set an upper bound to the insolvency probability of a financial intermediary. CARs are an imprecise tool for achieving this outcome. An approach based on VaR is better.

When bankruptcy of a financial intermediary is impending, a bailout is desirable when its bankruptcy could force other healthy firms into bankruptcy. These externalities are often referred to by the evocative term 'contagion'. Bailouts, which seek to block contagion, lead to 'moral hazard', as firms take excessive risks in the knowledge that the state will organize a bailout if needed. The moral hazard is particularly acute in India, given public sector ownership of intermediaries and a cultural reluctance in accepting bankruptcy as a normal outcome in a market economy. The recent decades in India have featured very few bank failures, hence most economic agents assume that bank deposits are safe, even though deposit insurance only covers the first Rs 100,000.

How can 'Contagion' be Blocked?

The second element in the way forward is to rethink institutional design in such a way that it generates incentive compatibility and blocks contagion. An important ingredient of this refashioning of the financial system is the concept of the 'clearing corporation' (CC). When A and B agree upon a contract, the clearing corporation interposes itself between them. A has a contract against the CC and the CC has a contract against B. The CC becomes a firewall which prevents bankruptcy of one side from affecting the other side.

The CC produces robustness without moral hazard. There is no incentive to organize a bailout when A is near failure, since bankruptcies leave counterparties unaffected. When the CC adopts such principal obligations, it has direct incentive to monitor the insolvency probability of all firms that it deals with, and to limit their risk taking. This monitoring would hence be far more effective as compared with that done by traditional regulators. CCs are the central risk containment device on securities markets worldwide and they have been highly successful in securing market robustness under the most hostile conditions: with highly leveraged trading, of highly volatile assets, by poorly capitalized intermediaries.

The idea of a CC, which cuts through the traditional complexity of prudential regulation, is not just a theoretical possibility; we have one CC in India today, the National Securities Clearing Corporation built on the equity market in early 1996. It has proven itself through the success of the National Stock Exchange (NSE) in avoiding systemic risk while other exchanges in India have experienced payments crises and systemic breakdowns. This success in institution building implies that the knowledge and systems required for it are available. The clearing corporation can play a role in solving problems of prudential regulation in many unexpected situations; an example of the repo (interbank repurchase agreements) market is presented in Chapter 17.

How can We Guard against the Consequences of Bank Failure?

The third element to the way forward is to rethink the role that banks can play in India's economy. India's banks and financial institutions are a remarkable combination of high leverage, poor knowledge of risk measurement and management, inadequate ability to control the conflicts of interest between employees and shareholders, a framework for prudential regulation which is riddled with conceptual and practical problems, and (in many cases) the unique moral hazard that arises from state ownership. Banking reforms are obviously important—ranging over issues from new strategies for prudential regulation to an elimination of state ownership.

However, the severity of the problems suggest that a complete rescue of the banking sector is probably unlikely in the next few years. In the years to come, bankruptcies and crises in India's banking system could take place, despite our best efforts at improving prudential regulation. Hence efforts towards reducing the exposure of India's growth prospects to banking crises are essential. We can prepare for the banking crises of the next decade on two fronts:

- The first is to hasten the pace of 'dis-intermediation' in India's financial system. Dis-intermediation is a powerful trend which has been taking place in India and abroad: the modern financial sector increasingly works

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through securities markets rather than through banks. This trend should be recognized and encouraged. In Korea, last year, we have seen people fleeing from banks to the safety of mutual funds. This is not an entirely far-fetched scenario, when we contrast the relative robustness of most mutual funds in India with that of most banks.

- Channelling financial sector transactions through securities markets helps at two levels: it diminishes the probability of a banking crisis and it reduces the complexity of coping with bank failure. The traditional loan can be replaced by the act of the bank buying bonds issued by the company that needs credit. When the bonds are liquid, and the bank revalues its assets daily on the basis of market prices, the ability to measure and manage the risk is multiplied manifold. Market-traded bonds pave the way for individuals and non-banks to directly lend to firms, thus reducing the costs of financial intermediation in the economy. Finally, bonds which are traded on the secondary market can be easily sold off as part of the process of closing down a bank.
- The second is to prepare the ground, politically, for failures to take place without bailouts. Banking crises impact economic growth by placing stress upon the fragile exchequer. If banks are allowed to fail without a bailout, then this channel is blocked.
- If banks are to be allowed to fail without a bailout, then steps should be taken to clarify the legal terms under which deposit insurance works, the citizens of India need to be alerted to the limited scope of deposit insurance, and government shareholding has to be eliminated in all finance companies. These would additionally serve to generate a more meaningful risk-return profile in the economy, where depositors would be more sensitive to risk when investing their funds.

THE EAST ASIAN CRISIS: LESSONS FOR INDIA

The performance of the East Asian economies over the past few decades had positioned them as role models for the rest of the developing world. Enormous effort was put into drawing lessons from the development strategies of these countries. The crisis that enveloped many of these economies in 1997 thus came as a shock to observers. Chapter 18, by Subir Gokarn, explores the implications of this episode for India.

At one level, the macroeconomic circumstances of these countries did not conform to the conventional wisdom about the pre-conditions for a crisis. The countries did not have large fiscal deficits accommodated by the central banks. Prominent attempts to explain the origins of the crisis, notably by Krugman (1998) and Radelet and Sachs (1998), focused on two sets of factors: one was the rapid build-up of external short-term debt which increased the vulnerability of the exchange rates in the event of any disruption; the other was the channelling of funds, including these external borrowings into speculative activities by an under-supervised financial system. In combination, these factors contributed to translating a failure of the domestic financial system into a run on foreign exchange reserves as short-term lenders rushed to get their money out.

While these explanations address the immediate dynamics of the crisis, there is a deeper question that needs to be asked. Was the crisis in any way an outcome of the East Asian development strategy itself? If so, what aspects of the strategy were responsible for it?

If we accept the explanation that an under-supervised financial system was in large part responsible for the crisis, we have to address the issue of why these hugely successful economies left their financial systems so unguarded. This is the question on which the immediate or 'proximate' factors leading to the crisis can be related to the deeper or 'structural' factors that emerged from the development experience of these countries over the past several years.

In Chapter 18 it is argued that the typical East Asian financial system was under-supervised precisely because the export promotion regime completely subordinated it. To a greater or lesser degree credit was allocated on the basis of export performance. As long as exports provided the major growth impetus in these economies, they provided a reasonably reliable monitoring mechanism for the allocation of credit. In other words, the financial system was subject to an automatic supervision mechanism because it was an integral part of the export promotion strategy. Under these circumstances, these countries did not really feel the need to put into place the more conventional regulatory mechanisms that we now notice the lack of.

The economies had been experiencing a slowdown in export growth in the year or so preceding the crisis, attributable to a combination of factors, among which are (i) China's export thrust, including a devaluation a few years before, (ii) Japan's prolonged and continuing slowdown, even recession, and (iii) rising wages in the fast-growing East Asian economies. Chapter 12 argues that the slowdown in exports placed the financial systems of these economies in a precarious position. Financing exports now provided fewer opportunities because of the slowdown. There was thus a temptation for these institutions to look for profit opportunities elsewhere, and, clearly, the stock market and real estate provided attractive, though risky returns. In the absence of effective supervision, there was very little to stop funds from being channelled into these areas. The fact that politically influential people were often behind these lending decisions only emphasizes the lack of a regulatory mechanism that could resist capture by such interests.

In sum, the precipitation of the East Asian crisis was due to a combination of structural and proximate factors. The former is attributed to the powerful disciplining effect that financing exports had on the financial system. The latter relate to the relatively high short-term external debt exposures of these economies on the one hand, and the risky lending decisions of their financial institutions on the other.

There are some obvious direct implications of the crisis for India, mainly trade related; the East Asian market for Indian exports will shrink along with these economies, and their sharp currency depreciations will make them a lot more competitive in global markets as their export sectors recover from the slump. However, there are also significant lessons from the experience. The main one stems from the threat from a banking system whose lending decisions are not made on sound commercial and prudential principles. The conditions in India may be different, but the well-known weaknesses in the portfolios of Indian banks make the system vulnerable. India does not have the same external vulnerabilities as the East Asian economies did. However, the collapse of the banking system, even if it is largely confined to the domestic economy, can seriously disrupt economic activity, something that the country can ill-afford.

HOW TO GO ABOUT PRIVATIZATION?

The general poor performance of the public sector in India has led to a fairly wide consensus that many public sector units should be privatized. How this should best be done is not clear. During the last two decades, thousands of public firms in various continents have gone private. During 1990–6, the global privatization revenues totalled around $ 155 billion. Given these figures, we need to carefully look into the privatization process and see if there are any lessons to be learnt for India. This is the subject of Chapter 19 by P. Guruswamy Babu and Nibedita Das.

Among the various methods for privatization such as natural restitution, voucher privatization, auctions, participation contracts, bargaining, and give-aways, one finds that auctions perform well in privatizing state-owned enterprises.

How could We have Done Better in the Telecom Auctions?

Auctions have been successfully used to privatize telecommunication monopolies all around the world. Also, of the overall privatization programmes during 1990–6, globally, telecommunications alone accounted for 24 per cent. Within a country the first enterprise to be privatized has often been the state-owned telecommunication utility. In India too, in May 1994, the GOI decided to open telecom services to the private sector with the objective of maximizing revenue generation from the auction of licences. Bids were invited for twenty circles of the country. One firm, Himachal Futuristic Communications Limited (HFCL) scored substantially over the second highest bidder in nine out of twenty circles. The GOI declared *ex post* a cap of three circles per bidder and rejected the highest bid in ten circles on the grounds that they were below the reserve price, without having revealed the reserve prices up-front. Hence a second and a third round of auction followed in these circles.

The process has not been a smooth one. Only two private firms, *viz.*, Bharti Telnet and Hughes Ispat, have started providing basic services in Madhya Pradesh (from 4 June 1998) and Maharashtra (from 30 October 1998) respectively. The others are seeking a re-negotiation of the licence fees they had bid for. The lack of well-designed policy (or the failure to implement it where one existed) and political indiscretion together with the lack of a proper regulatory mechanism has led to the withdrawal of many potential players from the bidding for licences. *Ex post* too, the telecommunications process continues to be riddled with controversies.

When a firm operates more circles it benefits from economies of scale. On the other hand, it gets monopoly power which may lead to loss of social welfare. Hence a restriction on the number of circles to be allotted to a single firm may be justified. However, this cap should have been announced at the beginning of the auction procedure itself, so that the bidders could have been more aggressive.

Another factor which plays an important role in the success of an auction is the announcement of an appropriate reservation price. It signals the value of the circle to be auctioned and helps bidders in their own evaluation. Therefore, the Indian government should have declared the reservation prices before the start of the auction so that the bidders would have had some idea about the expected price and the government would not have had to go for two further rounds of auctions. The fact that the government used the valuation of bidders in each round of auction as an input in deciding the reserve price for the next round is probably in the main responsible for the fall in bids in the second and third rounds. It is most likely that the firms formed a cartel and bid less so that the government was forced to lower the reserve price in each subsequent round. Another factor that points to collusion among bidders is that in the second round of auctioning, four of five circles had single bidders and the bid amount was very close to the reserve price set by the government in each of the circles.

The falling bids in the second and third rounds may also be due to the 'afternoon effect' or the 'price-decline anomaly' (i.e. if identical objects are offered to risk averse buyers in a sequence of bids, the bids in the second and consequent rounds of bidding are more likely to decline). In the Indian auctioning of telecom licences, one can see that almost all the bidders are without any experience in the provision of basic services in India. So in the first round of auction they were willing to pay a premium over their estimated price to avoid the risk of loss. But in subsequent rounds, as information is revealed on expected valuation by some players, the bids declined. A possible way out to stop prices from falling could have been to place a reservation price in the second round at least as high as the second highest bid in the first round of auction. The highest and defaulting bidder of the first round should have been asked to pay the difference between the two highest prices as a penalty to save Department of Telecommunication (DoT) from a possible revenue loss.

The substantial over-bidding by a single firm, HFCL, much above the bid of the second highest bidder shows that the auction mechanism did not provide sufficient safeguards against winner's curse, where the highest bidder finds that he has highly overestimated the value of the object and has to pay more than what it is actually worth and cannot escape unaffected. Winner's curse also results in underestimation by some of the bidders. When bidding involves substantial amounts, in a sealed bid auction, the fear of winner's curse makes bidders bid very cautiously. This is evident from the fact that in five circles, namely Assam, Himachal Pradesh, Madhya Pradesh, Uttar Pradesh (east), and the North East, Reliance was the only bidder for basic services. The comparison of bids for both cellular and basic services also reflects the fact that some companies have indeed bid very conservatively.

India could have used the simultaneous, ascending bid auction. According to this auction format, a group of licences with strong complementarities are open for bidding simultaneously. Bidding on these licences remains open till bidding ceases in every one of them. At the end of each round, all bidders are informed about the highest bid for each licence. While a bidder is allowed to enter bidding for any licence at any time, he is not allowed to withdraw a bid without a penalty. The auction in all licences simultaneously ends whenever there is a round with no new bids. Each round requires all the bidders to submit sealed bids. This form was adapted by the US to auction its spectrum licences. The superiority of this auction form is due to various factors such as superior information revelation, geographical aggregation, withdrawal penalties, and caps to promote competition.

These lessons should be useful in privatizing other public sector units. While we have discussed here the flaws in the auction process in telecom licensing, there was a more fundamental problem with the objective of the maximization of revenue. Government policy thus sought to replace a public monopoly with a duopoly. The objective of telecom policy should be to provide cheapest possible service to all. This would have been better served by inviting bids for minimum price of a basic package of services set by an independent regulatory authority.

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1 Second Generation Reforms

Kirit S. Parikh and Ajay Shah

The first phase of reforms, in the early 1990s, took place in an environment where there was a well-developed consensus among economists about the first-order problems which then afflicted Indian economic policy. Today, as we contemplate the second phase of reforms, it is important to place the economic policy problems in the context of the problems and opportunities for economic growth of India in the coming decade.

The revolution in information technology is transforming the global economic structure, especially in the light of the post-industrial service orientation of modern economies. Economic concentration and the role of transnational corporations are increasing. Financial integration into the unprecedentedly sophisticated global financial system offers new opportunities. Globalization is no longer an option: it is a fact.

THE DECLINE OF TRADITIONAL INDUSTRIAL MASS PRODUCTION

The bulk of income in post-industrial societies is generated in the services sector: once one has enough food, one wants it cooked by the best cooks; once one has enough clothes, one wants designer clothes.

This gives an appeal to brand names. Brand names add tremendous value to a product. A silk tie may cost only $ 5 to make, but the 'P' (Pierre Cardin) on it allows it to sell for $ 150! Going beyond this, the super-rich go for designer clothes—one of a kind, or limited edition clothes.

Modern information technology makes it possible to provide 'mass-produced personalized products': MPPPs. The advantage of MPPPs is that they satisfy the urge for individuality, and do it at affordable costs to the masses. Thus the future will belong to MPPPs where a great deal of value addition is done in the services sector. The MPPPs will supersede the branded products of today.

At the same time, growing global prosperity gives people more leisure and increases the demand for entertainment. Entertainment is the ultimate 'superior good', in the sense that all marginal income, beyond a point, is spent on it. The creativity of our writers, artists, and entertainers is a resource which has a potentially vast global market.

INCREASING ECONOMIC CONCENTRATION

The modern industrial economy is sustained by mass consumption. To sustain growth of such an economy one needs growing demand, which is ensured by the growing variety and improving quality of goods and services. When economies of scale exist, in production or innovation, this gives advantages to large firms. Two important characteristics of a modern economy are that it is mass market driven and it is technology dominated.

How long can demand keep growing? Since the large bulk of global population has a level of consumption that is way below that in industrialized nations, the scope for demand growth is very large. But even in industrialized countries, demand keeps growing, for human wants are insatiable. Also, to ensure ever increasing demand, manufacturers build in obsolescence in their products.

The insatiability of wants is not just confined to material goods. It is also for power and dominance. Firms want to be ever bigger, not just because economies of scale dominate but also because the chief executives want to be number one. Another important characteristic of present development patterns is the dominance by a few large firms with monopoly power.

While a large firm with economies of scale has the potential to supply goods cheaply, a monopoly has little incentive to do so.

Investors in stock markets who gather more information about firms can make better investment decisions and earn higher rates of return. However, the cost of collection of information does not depend on how much one has to invest. Whether one wants to invest Rs 10,000 or Rs one million it is the same. Naturally, one who has a million rupees to invest would collect more information and could obtain a higher percentage return. Thus the fixed costs of information gathering generate increasing returns to scale.

These factors combine to give large, global firms. We have seen how, even in software production, which is dominated by artisans chipping away at code instead of assembly lines, a few large firms play a very large role.

ACCELERATING TECHNOLOGICAL PROGRESS: MORE POWER FOR THE POWERFUL?

Technical knowledge has become the central factor of production. A firm's competitiveness depends on its command over technology. In the traditional world of economists, with only capital and labour as factors of production, every country has a comparative advantage in some products, no matter how inefficient its production system is (in a technical sense). In this world, a country with relatively more labour would export more labour-intensive products and import more capital intensive products. Even if a country has an absolute advantage in the production of both kinds of goods, i.e. it uses less labour and less capital in producing both kinds of goods compared to the other country, it would still be advantageous for the country to trade with the other country; the exchange rate would adjust so that mutually beneficial trade takes place.

Technical knowledge and innovation change the comparative advantage of a nation. A country can compete with other exporters when innovations reduce the domestic cost of production. Increased demand for a country's products can make its currency stronger. A country's competitive advantage, thus, rests on its ability to create an environment in which productivity growth is rapid.

Innovations depend on the stock of knowledge. The stock of knowledge is rapidly growing; the number of scientists doing research today exceeds the total number of scientists who ever existed earlier. Consequently new ideas, new products, new processes, new innovations, and new inventions are coming out at an unprecedented rate.

As a consequence of the increasing pace of technical innovations, products become obsolete long before they are worn out. The product cycle has become shorter and shorter. Firms have to recover their investment in research and re-tooling in a shorter and shorter period. This in turn requires a large market. Globalization is the way through which the massive global market—rather than any subset of it—is harnessed for this rapid recouping of investments.

The information technology that has swept through the world in the last decade is changing the world in profound ways. It affects production processes. Automation is now ubiquitous. Computer chips are everywhere, from refrigerators to washing machines to cars. The computer chips embedded by General Motors in their cars makes them the largest buyer of computer chips in the world.

These changes have made information a vital input into economic activities. Information provides a competitive edge to firms. A firm that knows more about customers is able to devise products which better cater to their interests. With better information about suppliers and availability, a firm can cut the cost of inputs. Good information technology can reduce the capital blocked in holding inventories to a fifth of traditional Indian norms for inventory.

With greater analysis about future possibilities, a firm can take more effective hedging actions using derivatives to reduce its risk. This is particularly important given the high price volatility that is seen on modern financial markets.

Unequal access to information and analysis will lead to growing inequality in the world. At the same time the information revolution and explosion is greatly stimulated by private initiatives with much beneficial impact. The challenge is to use it in a way that would benefit the poor and help reduce the inequity rather than accentuate it.

The information revolution provides an opportunity to developing countries to leapfrog and catch up with the developed world. To leapfrog, however, the frog has to come out of the well. A *koop-mandook* cannot leapfrog. We have not only to embrace this technology but make it universally accessible. This calls for cheap telecommunication facilities. Telecommunication reforms that lead to a competitive telecom sector are critical if India is to benefit fully from the new information technology.

THE ADVANTAGES OF AN OPEN SOCIETY

Consider the largest economy in the world today, the US. It has a great advantage in developing new technologies: it is a society that encourages individuality; it has an excellent educational system; it has a large pool of science and technology personnel and a system that provides research support on merit. Government and industry spend a lot of money on research and development. Property rights are associated with knowledge and creators of knowledge obtain large monetary benefits.

The US attracts the best and the brightest from all over the world. Culturally, it cherishes diversity and avoids sectarian or ethnic discrimination. Finally it has a unique financial system, which is able to award resources to good projects, is willing to take risks, and offers the means (derivatives) through which risks can be shared and transferred. Venture capitalists play an important role in the knowledge-based economy: they help finance the process of bringing new ideas to commercial success, provide managerial support, take the risk of failure, and often make a killing. All this has produced many innovator millionaires and some billionaires, a record unmatched by any other country.

In India, today, we have many of these ingredients needed for becoming a knowledge-driven society, and a major source of innovations. This is in contrast to many Third World countries, which suffer from authoritarian or religious societies. We have a democratic society where individualism can flourish. Generally, modern workplaces are blind to differences between people of diverse ethnic, religious, caste, or national backgrounds. Women are not barred from public spaces in India. We have a tradition of respect for learning. We have many educated and trained people who have proven themselves on a global scale; they have demonstrated their ability for creativity and enterprise around the world, including the Silicon Valley. Hence we can aspire to become the innovators, the designers, the thinkers, and the artists of the world.

GLOBALIZATION: A FACT, NOT AN OPTION

Communications technology reaches a large part of the world's population. The World Cup final was watched by billions of people around the world. This integration brings awareness about what is possible and what is available, and the demand for new products and pleasures arises. A global market has developed.

Globalization is now a fact, not an option. The communications revolution has turned the world into a global 'village' where everyone knows what is going on and what is available.

Trade in goods as a percentage of GDP generated by production of goods has increased from 64 per cent to 94 per cent over the decade 1986–96. For high income countries, this ratio has grown from 70 to 179 per cent, which illustrates how globally integrated these economies have become. The emergence of multinational firms and a global market has also led to a deeper integration of production. Parts and components are sourced from different countries and intra-firm trade has become a large part of global trade. A modern car or a computer would generally have components coming from scores of countries. The ease of communication and ubiquitous large computing power have made possible such widespread integration. The diseconomies of scale have been pushed back as IT has made it possible to manage larger firms efficiently. This has accelerated the growth of large transnational corporations (TNCs).

The telecommunication and IT revolution has opened up a new set of opportunities. So far, only global manufacturing had shown deep integration whereby links in the production chain spanned several countries. The same is now possible for the services sector which, as noted earlier, is much larger and growing faster. The size and scope of trade in services are much larger than is commonly perceived (see Box 1). Free trade in services will help us export skilled white collar labour services, just as free trade in manufactured goods permits us to export blue collar labour services.

The benefits of free trade go beyond the volumes of goods and services traded. The opportunity to trade freely imposes a strong discipline on local producers. Competition from imported goods improves quality and lowers cost of domestic products. This disciplinary impact is a function of the prices at which trade is possible and not the volumes traded. As long as international markets are competitive, free trade benefits a country but with the growing power of TNCs, countries may need to impose 'optimal tariffs'. However, just because a tariff may be acceptable in some cases, there is no justification for imposing it arbitrarily. The case for each particular tariff must be clearly made. This requires refined skills in policy analysis.

FINANCIAL SECTOR INTEGRATION

Globalization has become most visible in the financial markets. Today, there is phenomenal flow of financial capital across countries. Private capital flows for direct investment and portfolio investment to developing countries have grown rapidly from $ 25 billion in 1990 to $ 150 billion in 1997. For low income countries, net private inflows have reached 4 per cent of GDP. With a reasonable capital-output ratio, this should mean an additional growth rate of 1 percentage point.

Box 1

The Export of Services Using Modern Telecommunications

Low price telecommunications open up a new breed of opportunities through which firms located in India can export services.

- The dominant export in the services sector, of course, is computer software, where the work of hundreds of thousands of people in India is exported. It is not an accident that the software boom in India really took off after Internet services first became available in India, no matter how clumsy and expensive.
- Scientific research and development is cheaper in India. This has motivated a number of multinational firms to come to India, especially in the areas of computer software, integrated circuits, and pharmaceuticals.
- Doctors outside India usually dictate notes after routine checkup of patients. Secretarial services are cheap in India. There exists an arrangement whereby doctors in Canada dial a special number which instantly connects them to a pool of secretaries in India who are trained in medical jargon. The doctor dictates a log about the patient for a couple of minutes while the secretary takes notes which are typed into a computer and sent to the doctor's computer in Canada via Internet. Thus a secretary in India works for a doctor in Canada.
- Database and information services based in India can create and package products demanded in international markets.
- Many financial sector activities are location independent. Firms such as GE Capital and AIG have commenced moving some of their international operations to India. Indians excel in finance worldwide: hence we can aspire to become an international centre of finance in the manner of Singapore or Hong Kong.
- There are companies in the US where 'technical support' for highly skill-intensive technology products is done from India. A customer in the US dials a toll-free 1-800 number and the call is shunted to a customer support centre which is physically located in India. The customer in the US is not even aware that his call has been fielded by someone across the globe.

Each of these illustrates the 'labour arbitrage' which is made possible by employing highly skilled workers in India, who can earn much higher wages once adequate telecommunications facilities exist.

The size and scope of these activities is enormous. Some observers have expressed the view that service exports cannot be large when compared to India's macroeconomy. We may observe that even though we have one of the worst telecom services in the world, software companies today account for a remarkable one-sixth of the market capitalization of India's corporate sector—the bulk of the revenues of India's software industry are derived from exports. (This calculation ignores all other kinds of service exports.) This is a remarkable outcome—most of these companies are less than a decade old and require minuscule amounts of capital when compared the rest of India's corporate sector.

Foreign exchange trading has seen a dramatic growth from about $ 15 billion a day in 1973, to an average of $ 1260 billion a day in 1995, seventy times larger than world trade per day. These flows, which helped some countries develop rapidly, can cause a meltdown if domestic financial institutions are not properly supervised or if short-term borrowings are used for long-term investments. Integration with the global economy provides the country opportunities for efficiency and growth but entails risks. The country gets exposed to international shocks and policy mistakes of other countries. However, does global integration improve human welfare? Are the gains of growth more than the pains of added volatility? Are there ways in which a country can globalize while shielding itself against the ill-effects? We do not have clear, generally accepted answers yet.

The process of globalization is a central source of change in the world today. It can lead to widely shared inclusive prosperity or highly uneven development from which a significant number of countries and people are excluded. To benefit fully from it, to turn it into an opportunity, India has to adapt its policies. We have to carry out the second generation of reforms.

OUTWARD ORIENTATION—II

In the 1960s and the 1970s, a debate was played out amongst economists about the importance of an 'outward orientation'. Economies which emphasized exports of manufactured goods have often fared better than inward-oriented economies, for a wide variety of reasons. India chose to walk along an inward-looking path and missed out on the enormous expansion of global trade.

Today, the growth of manufacturing exports from India faces three basic hurdles: poor infrastructure, a high cost of capital, and high barriers to imports. While these problems should be attacked, it may be years before they are fully addressed.

In contrast, the area of service exports is remarkable since it requires only limited infrastructure and is not capital intensive. Telecommunications infrastructure is central to these opportunities and it is the cheapest kind of infrastructure to build. High interest rates do not deter investments in India's service sector (where India's comparative advantage is higher) as much as they deter investments in the manufacturing sector.

Hence an accent on the export of knowledge-oriented services could be a remarkable niche for India to exploit. This will be particularly appropriate if the expansion of global trade in services in the coming decade proves to be something like the growth of world merchandise trade in the preceding decades.

If India is able to obtain an outward orientation with an accent on service exports, all the benefits of outward orientation would accrue to us. Individuals in India would earn high wages. Competing in global markets would drive the pace of knowledge acquisition. Exports growth would generate confidence, reduce the archaic fears of 'shortage of foreign exchange', and pave the way for further import liberalization.

FACING THE NEW MILLENNIUM: THE SECOND GENERATION OF REFORMS

The reforms initiated in June 1991 sought to make the Indian economy a fast-growing one. Rapid growth was desired in order to better deal with the problems of poor human development. It was to be realized through more efficient use of resources. For efficiency, both domestic and international competition were considered essential. What are the major accomplishments so far?

- The most rapid progress has been made in the domestic deregulation of industry. The system of industrial licensing and production controls has been dismantled. Indian firms are now free to decide what, how much, where, and how to produce except for eight strategic or environmentally critical industries. Foreign manufacturers now compete on Indian soil. Thus domestic competition has been greatly enhanced.

- Trade has been liberalized considerably. Many goods can now be imported on 'open general licence', i.e. without a licence. There is now partial convertibility on the current account . Tariff rates have dropped significantly. The maximum rate is now 40 per cent as compared to levels like 250 per cent earlier. The variation of tariff rates across goods is also reduced. These rates will be brought down further as part of our commitment to the World Trade Organization (WTO).

- A government must impose taxes to provide many social services that it can provide best. Yet taxes distort relative prices and incentives. An efficient tax structure is thus critical for an efficient economy. Income tax reforms have been more or less accomplished and the maximum marginal tax rate at 30 per cent (with a 'temporary' 10 per cent surcharge) is comparable to international levels. Significant simplifications have been made in excise rates in the budget of February 1999.

- Many steps have been taken in financial sector liberalization. Interest rates have been partially freed. Private entry in banking has taken place. Banks are required to satisfy prudential norms to reduce the chances of bank failure. Dramatic institutional change has taken place in securities markets in the form of electronic trading, a clearing corporation (CC), and a depository. The open electronic market which we see in India's equity market is the most transparent form of market organization in the world. These changes, put together, have yielded some of the lowest transactions costs on India's equity market, by world standards. These reforms make the financial markets more efficient, reduce the cost of capital, and serve to direct it to most productive uses.

What has been accomplished is significant. Yet much more needs to be done to reap the full benefit of what has so far been done. The new millennium offers us a world of opportunity to partake fully in the global trade of MPPPs and of white collar services, to sell designer services, to entertain the leisure class with creative output. The second generation reforms should aid Indian firms to grow and become multinationals, to let the creativity of our people flourish to acquire a technological pre-eminence in selected areas and to encourage them to exploit to the full opportunities provided by a global world of knowledge industries. This will not only help turn India into a fast growing economy, but also a humane society with the highest levels of sustainable human development.

What reforms are needed for this?

Exploiting the Knowledge-based Global Economy

Telecom

The first and foremost area for progress towards a knowledge-based economy is telecommunications. As highlighted above, integration into the world economy, and export of services, hinges on low price and high quality telecom services being available. India's telecom sector has failed in producing these services. Some telecom services in India cost 10 to 100 times more than comparable services abroad. We have talked about reforms in telecom since the early 1990s but have made limited progress. Box 2 summarizes the vital inputs that should go into telecom reforms.

Box 2

The Agenda for Telecom Reforms

- The Department of Telecommunication's (DoT) draconian 'Closed User Group' policy, which is incompatible with sensible economics and with the basic idea of a liberal democracy, should be abolished. All interconnections between the citizens of India should be permissible and free of censorship.
- Videsh Sanchar Nigam Limited's (VSNL) monopoly on international telecommunications needs to be replaced by unrestricted competition, without requiring licence fees.
- Domestic long-distance telecom should similarly be a market with unrestricted competition where private and foreign firms face no entry barriers.
- Licence fees for basic services and mobile telecom should be abolished. New technologies, such as cable vendors, should be able to offer telecom services, such as Internet access, without permission requirements or licence fees.
- The electromagnetic spectrum is a vital resource which enables many telecom services. The defence services have appropriated an inordinately large fraction of this scarce resource and a lot of these frequencies should be freed up for civilian use. They should be auctioned off to the private sector. Frequencies should be tradeable on an exchange, just like shares. The Government should enforce property rights for the owner of a frequency, just as a squatter is prevented from misappropriating a piece of land.
- The Telecom Regulatory Authority of India (TRAI) should be strengthened and it should address the problems of interconnectivity and minimum standards of service quality. All discriminatory pricing, where prices of telecom services are higher for 'profit making entities' such as Internet service providers, should be abolished.
- The state should embark upon building public infrastructure for high speed data networking. This should be a wholesale facility through which anyone can obtain a 2 Mb/s leased line for domestic networking, for a total price like Rs 30,000 per month.
- The institutional landscape, which presently consists of DOT, TRAI, Mahanagar Telephone Nigam Limited (MTNL), and VSNL should be altered. The bulk of DOT, which is a telecom services company, should be converted into a limited liability company. The TRAI should be a strong regulator. A small 'Department of Telecommunications' should continue to work on policy questions, with no operational involvement in the telecom industry.

Higher education

The modern economy, certainly the knowledge economy, requires highly educated people. Primary education is critical and its importance cannot be overemphasized. For running a technology-intensive economy, we need to go beyond primary education and build institutions for higher education. Our experience of recent years has shown that a few high quality engineers and managers have made strong impact in various industries and on the economy as a whole. It is not an exaggeration to give credit for India's software revolution principally to seven institutions: the five IITs, NCST, and the IISc.

These institutions today face enormous constraints in terms of finance and operational autonomy. Their student intake is pitifully small when compared to the size of India's economy. A large increase in the number of institutions *of this quality* would have powerful impact upon our economic growth. Such 'elitist' institutions are consistent with democracy as long as admissions are open to people of all classes. In fact, they provide a way for bright persons from poor and backward classes to advance themselves. The government should fund the capital expenditure of such institutions and give annual support only to needy students.

Intellectual Property Rights

If Indian creativity is to flourish, it has to be rewarded. A system of intellectual property rights (IPR) will open up possibilities of huge rewards for innovators. We should establish a good IPR regime.

Venture Capital

The traditional culture of banks and bank-like institutions in India is oriented towards capital-intensive industrial projects, and they are ill-equipped to take risks in knowledge-intensive projects. New methods of operation in the financial sector, such as venture capital and 'private equity funds', are better suited to the risky projects of the knowledge-based economy.

The Growing Indian Transnational Corporations

Flexibility

If Indian firms are to compete with global TNCs, they have to be flexible in entry and in exit. They must be able to start new activities and also to close down unsuccessful ones. They need the freedom to redeploy resources and exit from unprofitable activities.

- This requires amending the Industrial Relations Act (the inability to retrench workers reduces efficiency by reducing the motivation of workers; this also slows down the process of re-allocation of resources in the economy; of course, workers should be protected against arbitrary retrenchment and the law should establish a due process for the retrenchment of staff).

Trade

Trade reforms are essential to directing resources in India to their most productive uses. Tariff levels should be brought down to internationally comparable levels. All quantitative restrictions, except for environmental and health safety reasons, should be eliminated. What is important is to realize that the ability to import freely is critical for exporters. The ingenuity of Indian entrepreneurs will find myriad ways to exploit these opportunities.

Barriers to intra-Indian commerce

Free domestic trade is as important as free international trade. Anything that obstructs it should be eliminated. Thus all restrictions on movement, storage, and trade of agricultural commodities should be removed. Both farmers and consumers will benefit if they do not have to bear the cost of inefficient monopolistic public sector trading organizations.

Equally important for free domestic trade is the removal of indirect barriers imposed by octroi and differential state taxes, which should be high on the agenda. Octroi should be replaced by a property tax. However, this will not work if property prices are artificially depressed due to rent control. Measures to rationalize the rent act are needed. Rents should be adjusted with inflation. Unearned gains in property values should be largely captured by the municipal authorities.

Till such a time that property tax can replace octroi, a surcharge on diesel should replace octroi. Since truck operators claim that the total efficiency costs of octroi are far greater than collections, this can reduce transport cost as well as increase municipal revenue, a truly win-win outcome.

Risk taking

The knowledge based economy has a fast-paced environment with rapidly changing prices. Firms and individuals would find it difficult to operate in this environment without tools to hedge against these risks. This is especially true for technically skilled first-generation entrepreneurs, who do not have a well-diversified conglomerate of family businesses to cushion them from risk. An entrepreneur takes enormous risks when he chances everything on one project. Markets for risk, or derivatives markets, give people an opportunity to take greater control of their risks. We should build options and futures markets which permit larger number of people to hedge their risks.

In addition, a proliferation of index funds will provide small investors less risky ways to supply risk capital on the stock market.

Box 3

The Agenda for Financial Sector Reforms

The financial sector has to support the growth of firms with low-cost access to debt and equity capital. It has to be a discerning source of capital, supporting robust projects while avoiding others: offering capital at a low price to low-risk projects and demanding a high price when faced with high-risk projects. The agenda for reforms on India's financial sector, today, may be summarized as follows:

- On the equity spot market, a conversion to 'rolling settlement' is the last major step required for a world class equity market.
- A liquid debt market does not yet exist in India. The institution building that has taken place on the equity market in recent years can be rapidly applied towards this.
- The introduction of options and futures on the equity index has been delayed for three years. The process must be hastened. Additionally, such markets should be developed for interest rates, the dollar–rupee exchange and for commodities.
- The banking system presents severe challenges in terms of coping with the risk of bankruptcy and impending bank failures. The viability of banks would greatly improve by permitting less risk taking. We also need to start planning for possible bank failures of the next few years, in order to cope with this contingency.
- Venture capital funds and private equity funds are the most effective means of financing innovative firms in the new knowledge-based economy. Their growth should be greatly encouraged.
- Progress towards capital account convertibility will reduce the cost of capital for projects in India on both debt and equity markets.

Capital account convertibility

Indian investors should have a level playing field with foreign firms. They should have the same access to international capital markets. We should liberalize and move towards capital account convertibility. While the East Asian crisis has put convertibility on the back burner, we should learn from their mistakes and move towards it, albeit with caution (see box 4).

Box 4

Is the Case for Capital Account Convertibility Sound?

In the aftermath of the East Asian crisis, many economists have voiced concerns about capital account convertibility (CAC). Is the case for CAC still sound, and what do we need to do to avoid the crises that have engulfed Thailand, Indonesia, and Korea? From India's point of view, the relevant question is 'Can India augment its resources by opening up to international capital flows?' The answer to this must be yes.

East Asian economies—Malaysia, Thailand, Indonesia, Philippines, and China—have seen large inflows of foreign capital which have surely boosted their growth rates. Even with partial liberalization in 1997–8, India got FDI and portfolio investments amounting to 1.7 per cent of its GDP. We could attract much more. The potential gain can be very large. An inflow of US $ 20 billion, if it results in additional investment of that magnitude, could raise India's GDP by 2 per cent.

Does CAC help in attracting more FDI? By itself, financial liberalization is not adequate to do so. One needs other complementary policies. India is an attractive place to invest, and with appropriate policies we could benefit a lot. But what are the dangers? Financial markets have been characterized by 'manias, panics and crashes'. How can a country obtain the benefits of CAC, while protecting itself against the over-reacting herd mentality of financial traders?

This is a problem only for financial trades because these are now almost instantaneous, and not so much for commodity trades which still take time. Foreign financial flows come in three forms: loans or borrowings, portfolio investment, and direct investment; each has its problems.

The most obvious way a crisis can develop is when domestic banks borrow internationally and lend domestically for unproductive activities. Specifically, Indonesia and Malaysia have been accused of 'crony capitalism'. But this had provided years of high growth and cannot be called dubious lending by itself. A bank may be lending to cronies and yet may be meeting prudential norms. The danger of lending to cronies is that one becomes lax in assessing the risks, thus leading domestic banks to make poor loans which can result in crises.

Similarly, when bank loans finance a real estate boom or a stock market boom, there are risks. If the boom is a bubble, with valuations far out of reach of the real underlying values, a collapse is inevitable. Banks loaning against real estate or stocks as collateral get into trouble when the bubble bursts.

Another way a liquidity crisis can develop is similar to bank run. If domestic banks of a country borrow from international markets on short term and loan domestically on long term, a term structure mismatch develops. Even with creditworthy projects, if a rumour induces panic and herd behaviour, it may lead to a liquidity crisis and, eventually, to devaluation if domestic reserves are not adequate.

Portfolio investment can increase volatility in domestic stock markets, but it also has the potential to be self stabilizing. If foreign investors all want to pull out at the same time, it would lead to a fall in stock prices; that would discourage them from going out. If they still decide to withdraw despite their losses, a country with inadequate reserves might have an exchange crisis leading to devaluation.

Finally, direct foreign investment can also lead to an exchange crisis, depending on the terms on which the investment is made. For instance, consider a power plant. If a foreign investor in the project is given a guaranteed rate of return that is greater than the social rate of return, then the investment can be immiserizing. For example, the first agreement signed by the Maharashtra government with the Enron Corporation guaranteed an internal rate of return exceeding 30 per cent on its claimed equity which may have been inflated. This, of course, was conditional on Enron generating electricity as promised, something that involved little risk.

In all these scenarios, crisis leads to devaluation, disruption in the growth process, and much social pain. The country's productive assets are sold dirt cheap in a distress sale. This is particularly troublesome when the real values of the assets are higher than the nominal value because of distorted prices and unrealistically low exchange rates.

In these possibilities, the common thread is that herd behaviour can turn a crisis into a catastrophe if a country does not have adequate reserves. Since we cannot do anything about herd behaviour, we need measures to withstand it. The obvious way is to limit short-term borrowing and ensure 'adequate' reserves. If the RBI holds reserves to protect against a crisis associated with short-dated capital inflows, then these reserves are effectively a form of free insurance against short-term currency volatility, and serve to encourage short-term inflows. RBI should finance the cost of holding additional reserves by imposing a tax on short-term inflows.

It is worth noting that the CAC committee of the RBI had, along with stringent fiscal discipline, banking sector reforms, and/or a flexible exchange rate policy, recommended that foreign exchange reserves should account for short-term debt in addition to import needs and possible changes in the lead–lag relationship between import payments and export realizations. These preconditions would be even more beneficial than CAC. Albeit cautiously, India should move towards CAC.

Equity and debt markets

India's equity market has made enormous progress. Only one element (rolling settlement) stands between India's equity market and the best international standards. At the same time, the debt market remains hobbled by archaic institutions. A liquid, long-term debt market would greatly enable the growth of firms and the financing of infrastructure.

High Growth of Agriculture

Liberalization in agriculture

Indian farmers are no different than other entrepreneurs—they adopt new technologies enthusiastically, respond to price signals, and grab opportunities to increase their own well-being. The principal reform needed is to free farmers from all domestic restrictions on storage, transport, and sale of agricultural products. The present policy of low output prices and subsidized (low) input prices puts a net tax on farmers; we should change to a system of internationally competitive prices for both inputs and outputs. To protect poor consumers, it is much better to provide an effective targeted safety net rather than distort food prices which has high costs as compared to the benefits.

The role of the state

The responsibility of the government is to ensure that adequate public investments are made in irrigation, agricultural research, and infrastructure that ensure well-functioning markets and facilitate exports. For providing food security, the government should follow a mixed strategy of modest buffer stocks supplemented by occasional trade on the world market.

Empowering the Poor

A safety net that works

We can eliminate poverty by consolidating our various anti-poverty measures, of indifferent effectiveness, into a coherent targeted safety net for the poor. Employment programmes are the most effective kind of anti-poverty programme. If wages are kept below the minimum, such programmes are self-targeting, self-liquidating, and self-adjusting. The government has made a good beginning by announcing its intention to combine the various programmes into one and give village panchayats the power to implement these.

While eliminating poverty is an important goal in itself, an effective safety net would additionally help enable other reforms which might temporarily worsen poverty.

Old age security

We need to set up a system for old age income security. The increase in life expectancy, the breakdown of the joint family system, and the desire for modern medical care have created several problems for the aged. The present system of provident funds (PFs), even for those few who have that facility, is grossly inadequate largely because of excessive early withdrawals and low rates of returns. The PF system has earned an abysmal real return of 2 per cent in the last decade. The long run average real return on the equity index has been 12 per cent.

We need to set up an effective system of saving with high rates of return, which can also reach the unorganized sector. In addition, poverty alleviation programmes for the elderly are also needed; these would need to be distinct from the employment programmes mentioned above. Yet, an approach to old age income security based on empowering people through a lifetime of saving is preferable to one that emphasizes receiving a dole in old age.

Human Development

Elementary Education

The new age of knowledge industries requires an educated population. Public policy should put a great accent upon expanding the quality and quantity of educational services in the country. Universal and compulsory primary education is only the first step. Empowerment of parents and local government is the key through which expenditures on primary education can yield the best results.

- Primary schools should be put under full control of *panchayats* to ensure effective functioning.
- Private sector initiatives in the *production* of educational services would fit well with the desire on the part of the government to *fund* education. The best way to achieve this is to empower parents. Instead of the Rs 3000 per child per year which is spent by the state in running a poor quality primary school system, parents should be given a voucher of Rs 3000 per child which they can use to pay to a school *of their choice*. This would spur private sector initiatives in offering educational services, and provide competition to government run schools which would need to improve their functioning to attract students and hence obtain vouchers.

A Clean Environment

Environmental damage

Environmental sustainability is not a luxury for the rich. It is doubtful if economic growth along with environmental degradation increases social welfare at all. We need to institute effective policies to preserve and regenerate environmental resources. Use of economic incentives, a system of public hearings and public pressure backed up by right to information and full liability laws can clean up our air and water. At the same time, degraded land and forests can be regenerated through participatory programmes.

Effective policies for cleaning up air require controlling industrial, vehicular, and household emissions. The state pollution control boards are unable to enforce the present standards for industry emissions for want of effective measurement and monitoring facilities. Once such facilities are available, a more effective policy to provide appropriate economic incentives to industry, would be a pollution tax related to the amount of pollutants discharged. If the measurements are made public, popular pressures would induce firms to clean up their emissions. These monitoring and measurement services could be out-sourced to chartered environmental auditors. These environmental audits could then be made compulsory.

For transport sector emissions, the most effective solution is the expansion of public transport. Emission standards for private vehicles must be enforced and stricter emission standards for new vehicles should be stipulated.

The use of dirty bio-fuels leads to half a million premature deaths each year. We should be able to provide cleaner fuels to all.

Improvements to Governance

Public Finance

Public finance reforms should get high priority in the second generation reforms. Only that can provide the needed funds to the government to expand social services and avoid financial sector distortions when the state pre-emptively obtains these resources.

The first-order issues in public finance have, so far, been *aggregate* expenditure, tax revenue, and fiscal deficit. However, it is equally important to take stock of expenditure patterns and measure the cost–benefit ratios of the myriad schemes and projects which have been accumulated over the years. We are suffering from very low quantity and quality of *outcomes* in the creation of public goods, given the levels of *expenditures* on them. One after another, governments have initiated schemes but not closed down enough of the failures. The myriad poorly run government programs are symptomatic of the poor governance which we have in India today.

Power Sector Reforms

The unfinished agenda of rationalizing electricity prices and eliminating subsidies to farmers and domestic consumers should be high on the reforms agenda. Without it, even private power will not become available. We are in a fragile situation today, where if industry goes massively for captive power plants, the present power systems will go into a state of near-breakdown.

Legal reforms

Accountability and the enforcement of contracts requires that we have a legal system that dispenses justice quickly, inexpensively, and sensibly. Reform of our legal system to make it so is vital for economic progress as well as social justice. These should work at two levels: the administrative problem of how courts work, and the basic problem of redrafting fossilized legislation.

IN CONCLUSION

These reforms are feasible. There is also a large political consensus regarding them. Lobbies of vested interests, and vocal minorities, would certainly object to some, but if we show courage and carry them out, India's development can accelerate dramatically.

Box 5

The Agenda for Reforms in Public Finance

- Completion of the tax reforms that have been begun: reduce tariffs, change to value added tax (VAT), harmonize state taxes, abolish octroi, amend rent control acts, and impose pollution taxes.
- Widen the tax net; introduce agricultural income tax.
- Sell public sector units (PSUs) and retire public debt.
- Remove non-merit subsidies and price economic services provided by the government appropriately. Such pricing reforms are critical in electricity, water, and fertilizer for the agricultural sector. Farmers should be compensated by higher output prices and more public investment in agricultural infrastructure. The poor consumers whose real income would go down when food prices increase, should be compensated by self-targeting programmes of income support, such as employment guarantee schemes.
- We need to take a comprehensive look at government spending today, with the objective of eliminating projects and schemes which fare poorly in a cost–benefit sense. The potential for expenditure reduction in this fashion could be as large as 50 per cent of expenditure.

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Macroeconomic Development and Prospects

Manoj Panda, Gangadhar Darbha, and Kirit S. Parikh

INTRODUCTION

After the wide-ranging reforms initiated in 1991 gross domestic product (GDP), which measures the aggregate income in the economy, grew by above 7.5 per cent for three years in succession during fiscal years[1] 1994–5 to 1996–7 giving rise to hopes of a higher growth path for the economy. Inflation seemed to be under control. Exports and imports too expanded substantially. There were large flows of foreign capital. This rosy picture, however, did not continue for long. Several key indicators of the economy seem to have taken a negative turn in the last two years. GDP growth rate seems to have reverted to 5–6 per cent since 1997; industrial growth—has declined to below 6 per cent since 1996–7; industrial investment—both private corporate and public sector—had slowed down since 1996–7; inflation was up again at high rates for several months in 1998; fiscal deficit, for centre and states put together, continues to be around 8 per cent of GDP; exports are not growing and in 1998 have in fact fallen in dollar terms; and foreign investment has slowed down. The economic decision-making environment in the country has undergone changes in the past two years with unstable coalition governments. Economic sanctions have been imposed by the USA after India's nuclear explosion in May 1998. A new dimension has been added to the liberalization debate by the so-called 'swadeshi' lobby. Finally, the global economy too is passing through uncertain times due to the East Asian financial crisis. Against this backdrop, questions that arise are:

- Why has the Indian economy slowed down in recent times? In particular, what has led to the deceleration in industrial production? How do we revive industrial growth?
- Why has there been a slowdown in industrial investment despite a high level of gross domestic savings?
- What is the source of the recent upsurge in inflation and how can it be contained? How effective can monetary policy be in containing inflation?
- Are exports down due to domestic policies or due to the global environment? How do we expand our exports?
- Why does the fiscal deficit persist? What measures could be taken to control it?
- What are the medium- and long-term prospects for the economy?

Answers to these and related questions call for a review of macroeconomic developments in India in recent times and an assessment of future prospects. This is what we intend to do in this chapter. The second section details the current major developments in the economy and analyses the problems in areas like industrial growth, exports, inflation, and fiscal deficit. The third section makes an assessment of the growth process from medium- and long-term points of view.

MACROECONOMIC DEVELOPMENTS AND PROBLEMS

Recap: The Story so far

The Indian economy has grown by about 4.5 per cent per annum on a long-term basis in the second half of the twentieth century. It grew by about 3.5 per cent per annum from 1951 till the mid-1970s. Growth picked up to about 5.5 per cent thereafter till early 1990 (Table 2.1). This somewhat higher, though below potential,

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[1] The fiscal year in India covers the April to March period.

TABLE 2.1
Annual Growth Rates of GDP and Major Sectors in the Economy

(as percentage)

Year	GDP		Agriculture		Industry		Service	
	Old series	New series	Old series	New series	Old series	New series	Old series	New series
1951–81	3.7	—	2.6	—	5.3	—	4.4	—
1982–90	5.6	—	3.4	—	7.2	—	6.7	—
1991–2	0.8	—	–2.3	—	–1.3	—	4.9	—
1992–3	5.3	—	6.1	—	4.2	—	5.5	—
1993–4	6.0	—	3.6	—	6.8	—	7.3	—
1994–5	7.2	7.8	4.6	5.4	9.4	9.3	7.5	8.5
1995–6	7.8	7.6	–2.5	0.2	13.3	12.2	11.1	9.8
1996–7 (P)	7.5	7.8	7.9	9.4	6.4	6.0	8.1	8.0
1997–8 (Q)	—	5.0	—	–1.0	—	5.9	—	8.2
1998–9 (A)	—	5.8	—	5.3	—	4.7		6.7

Notes: P: Provisional estimate, Q: Quick estimate, A: Advance estimate.
Sources: *National Accounts Statistics of India*, 1950–1 to 1996–7 by Economic and Political Weekly Foundation for data in old series. *Economic Survey*, 1998–9, for data in new series.

growth could not be sustained without creating major macroeconomic strains because of serious problems in financing it. It led to a severe balance-of-payments crisis in 1991 calling for stabilization measures. Simultaneously, it was also realized that the development strategy followed till then needed large-scale changes. As a result, wide-ranging reform measures were initiated in 1991.

While the basic institutional framework followed after Independence was a mixed economy with coexistence of both public and private sectors, a pivotal role was assigned to the planning process. The state machinery controlled the sectoral resource allocation through the instruments of industrial licensing and import permits. Public investment itself played a dominant role in the industrial sector. Domestic industries were protected through quotas and high tariffs of well over 100 per cent in several sectors. Industrial development took place in the environment in which industrial licensing prevented domestic competition and trade barriers prevented competition from imports. A more market friendly system was put in place after the initiation of reforms in 1991. Except for a few strategic industries, the licence system for establishment and capacity expansion was abolished. International trade was liberalized to promote competition and efficiency by removing almost all the import quotas (except on consumer goods) and reducing tariff rates to moderate levels. Foreign investment was promoted to modernize technology and take advantage of the global division of labour.

The notable feature of the growth process, both in terms of acceleration and deceleration during the 1990s, is the primary role played by the industrial sector. The easing of constraints from 1991 led to steady increase in industrial growth. Since 1996–7, however, it has sharply decelerated from 12 per cent in 1995–6 to 6 per cent or less. There was no evidence of a revival till end of 1998. In terms of composition, the variations in industrial growth are primarily dominated by changes in manufacturing growth rate, with electricity and mining showing a relatively stable growth pattern. Further, use-based classification scheme indicates that basic and intermediate goods have shown steady growth during first half of the 1990s. Capital goods and consumer durables on the other hand, have shown a remarkable turnaround in the revival phase with growth rates increasing from –0.1 per cent and –0.7 per cent in 1992–3 to 17.9 per cent and 36.1 per cent in 1995–6 respectively. There has, however, been a sharp fall in the growth rates in these industries after 1995–6. The recent slowdown in the overall industrial growth seems to be marked by a general deceleration running across most of the constituent industries. For example, 10 out of 17 two-digit industries have shown a growth rate of less than 5 per cent during 1996–7 and 1997–8. There has also been a decline in the growth of the composite index of infrastructure sectors—consisting of electricity, coal, saleable steel, cement, crude, and petroleum products—from 11.9 per cent in 1996–7 to 4.7 per cent in 1997–8. This decline has mainly come from the steel, petroleum, and coal industries, with cement and electricity showing some resilience.

Why Has Growth Slowed Down?

Industry

The proximate determinants of the deceleration in industrial output are: deceleration in industrial investment, exports, and consumer demand generated by low growth of rural incomes coupled with moderate growth in money supply and credit, and infrastructure bottlenecks. A sharp fall in exports of manufactured goods has been a major cause for industrial slowdown on the demand side. Exports in turn fell due to domestic factors such as an overvalued (non-competitive) exchange rate and infrastructural bottlenecks, and external factors such as the East Asian crisis and deceleration in world economic growth. We elaborate on these factors later. At the same time, the relatively cheaper imports put competitive pressure on several industries like steel, chemicals, and electronics.

There has been significant decline in both public and private corporate investment with annual growth rate in gross fixed capital formation (GFCF) falling from 18.9 per cent in 1995–6 to 6.3 per cent in 1996–7 and 5.2 per cent in 1997–8. This in turn has adversely affected the demand for industrial products (*via* the inter-sectoral linkages and resulted in lower industrial output). Similarly, the real value added in agriculture increased by an average of 1 per cent per annum during 1995–8 in contrast to a 3.5 per cent growth during 1991–4.[2] This, in turn, led to a decline in rural incomes and adversely affected the demand for industrial products, particularly consumer durables.

Besides demand related factors that adversely affected industrial output, the supply of finances to the industrial sector from different sources—banks and capital markets—has not been sufficient to support higher growth. Money supply (M3) and non-food credit to the commercial sector have been growing at an average of 17 per cent and 13 per cent during 1996–7 and 1997–8 compared to 19 per cent and 17 per cent during 1991–2 to 1995–6 respectively. Even the moderate growth in M3 in the last couple of years is due to a significant increase in net bank credit to the government. The annual growth rate of loan disbursements by the all-India financial institutions such as IDBI and ICICI have also declined from an annual average of 26 per cent for the period 1991–2 to 1995–6 to 15 per cent since 1996–7. The total flow of funds from banks to medium- and large-scale industries, including loans, and investment in commercial papers, has been moderate with annual growth being 10 per cent during 1996–7 and 14.5 per cent during 1997–8. Capital markets (both primary and secondary) have also remained depressed for the last couple of years, drying up the source of investment funds for industry. While small and medium corporates have found it difficult to access institutional funds, banks have been cautious in lending due to the high incidence of non-performing assets (NPAs). Relatively higher costs of borrowing have also affected several industries.

There has been some controversy regarding whether there was 'credit crunch' or perceivable contraction in credit supply to the commercial sector since 1995–6 and to what extent it is responsible for the slowing down of industrial growth. The corporate sector at large has attributed the industrial slowdown since 1995–6 to the lack of access to adequate credit along with other factors such as decline in export growth, lack of progress on various reform measures, and political uncertainty. However, the monetary authorities argue that there was no 'credit crunch' and in fact there was 'moderate' growth in credit to the commercial sector compared to the previous years. The commercial banks also complained that there are no takers for their funds and the observed moderation in bank credit to the commercial sector is primarily demand driven. In this regard we observe that, first of all, a moderate growth in credit to the commercial sector itself does not tell whether the sector is credit constrained. If the demand for credit increases more than the supply, credit constraints will prevail even if the supply of credit is 'moderate' or 'higher' as compared to previous years. In fact there was a sudden shift in demand in favour of domestic bank credit during 1995–6 as the corporate sector expected a depreciation of the rupee and shifted out of foreign currency borrowings. To the extent this additional demand was not met, it was forced to cut down on some its activities.

Similarly, throughout the period since 1995–6 interest rates have remained very high across the board, both in nominal and real terms, with the interest rates on government market borrowing setting the floor. This in turn negatively affects the demand for credit from banks by those who are relatively 'creditworthy' and to whom the banks are willing to lend. Banks at the same time may not be willing to lend to 'risky' borrowers who are willing to borrow even at high costs. This generates a scenario in which there exists both excess demand for funds from risky borrowers and excess supply of funds to creditworthy borrowers. Either due to the high cost of borrowing or due to the lack of access to adequate credit, the corporate sector will have cut down its plans for investment and current production. While the initial adverse impact of a monetary contraction is on a selected set of industries, over a period this would result in a general deceleration in output via forward–backward linkages. Finally, it is quite possible that moderation in growth of money or credit adversely affects the growth of industrial output in the initial years which in turn has a negative feedback effect on for further demand credit.

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[2] For comparability across periods, we have not used, in this case the new GDP series available from 1994–5 onwards. In any case the conclusions remain the same qualitatively.

Agriculture

While the agricultural sector has grown at an annual average rate of 3.5 per cent during early 1990s, and thereby supported industrial growth, it has not been stable since 1995–6. In fact, there has been an absolute decline in agricultural production during 1995–6 and 1997–8. As in the industrial sector, the decline in output of the agricultural sector during 1997–8 has been associated with a general decline in most of the commodity groups. In terms of composition, foodgrain production has recovered during 1996–7 and 1997–8 to the 1994–5 level of 191 million tonnes after a significant fall in 1995–6. It is important to note that despite good monsoons in the early 1990s the average growth of foodgrain production for the 1990s is 1.3 per cent compared to 2.5 per cent in the 1980s. The production of commercial crops, on the other hand, has increased at a stable rate throughout the 1990s, except for the year 1997–8 during which its growth rate has been -6.9 per cent. This declining trend in the growth rate of foodgrains in itself need not be a cause of concern as it may be a result of a rational response of farmers to an increase in the relative profitability of commercial crops. The substantial stock of foodgrains with the government could always be used to match the demand for foodgrains in the event of a shortfall in supply. Trade in food commodities could also be pursued as a policy option to match the demand and supply for foodgrains.

Services Sector

Another important feature of the growth process in the 1990s is the continued dominance of the services sector as an important contributor to the overall growth of the economy. As in the 1980s, the growth in services sector continued at a steadily increasing level throughout the 1990s. The average annual growth of the services sector has increased from 6.6 per cent during 1981–90 to 7.1 per cent during 1990–8. Following the general trend in other sectors, there has been a slight deceleration in the growth of this sector since 1996–7 although the annual growth rate still remained way above that of the manufacturing sector. In terms of composition, barring real estate, most other services sector industries have experienced steady growth in the 1990s. In the case the construction sector, there has been a turnaround with annual growth rates increasing from 0.94 per cent in 1993–4 to 9.72 per cent in 1995–6, while the growth in real estate has remained low at around 3 per cent throughout the 1990s. The deceleration in the growth of the services sector since 1996–7 seems to be driven by the slowdown in the growth of finance and banking, trade, and real estate services sectors.

Available data for the current state of the economy do not indicate any prospect of an early and fast revival. Advance estimate of GDP by the CSO indicates a growth of 5.8 per cent during 1998–9. This improvement is largely due to improved agricultural production. But the gain here would be neutralized by a further fall in industrial growth rate. Data available for the first three quarters of 1998–9 indicate only a 3.5 per cent rise in the index number of industrial production. But the capital goods sector has grown by about 10 per cent providing some signs of a recovery in the near future. Looking at short-run explanations for the industrial slowdown, our analysis essentially drives us towards exports, credits, and investments factors elaborated in the next section.

Savings and Investment Growth: How to Boost Foreign Investment?

The gross domestic savings rate has continued to rise after liberalization. It rose from above 20 per cent of GDP in the late 1980s to above 24 per cent in recent years, though it has declined to 23 per cent in 1997–8. The household sector continues to account for about three-quarters of the total savings in India. The peak in savings rate of 24.4 per cent in 1996–7 has been attributed to a large increase in household financial assets by about 2 per cent of GDP. Household net financial savings have gone up further from 10.8 per cent of GDP in 1996–7 to 11.4 per cent in 1997–8 (RBI Annual Report, 1997–8). This increase is primarily due to increase in bank deposits and contractual savings mobilized from households . On the other hand, financial savings in the form of shares and debentures held by households declined, reflecting industrial deceleration. Savings from the private corporate sector have increased from below 3 per cent of GDP in 1990–1 to about 4 per cent at present. Public sector savings have failed to increase in recent years despite pronouncements by the government to raise it.

Gross domestic capital formation has remained higher than gross domestic savings by 1–2 per cent of GDP. Foreign savings bridged this investment–savings gap. Foreign direct investment (FDI), which was virtually non-existent prior to the 1990s, rose for the sixth year in succession and reached a peak of about $ 3.2 billion in 1997–8. It is not, however, likely to rise further during 1998–9. Portfolio investment fell substantially to $ 1.8 billion during 1997–8 from $ 3.3 billion in the previous year and is likely to fall further in 1998–9. This reflects the adverse developments in the Indian stock market in response to the currency turmoil in East Asia as well as rising stock prices in the USA.

As pointed out earlier, there has been a perceivable fall in industrial investment—both private corporate and public sector—since 1996–7. The fall in the (expected) profitability of the industrial sector associated with an increase in agricultural and fuel prices relative to manufacturing prices and the low demand for manufactured products, discouraged any medium- to long-term investment plans by the corporate sector. The political instability further aggravated the uncertainties associated with relatively longer-term investment. The pressure on the government to reduce fiscal deficit has adversely affected public investment leading to an overall drop in industrial investment.

A major factor contributing to capital inflows in 1998 has been the success of the Resurgent India Bond (RIB) in raising $ 4.3 billion from non-resident Indians. But effective steps to use this amount in the promised area of infrastructure development are still awaited. Similarly, investment flows of a few billion dollars from international development agencies been delayed due to sanctions imposed after the Pokhran-II nuclear explosion. It is not clear at this moment how long such sanctions will continue. If lifted early, it is possible that long-run investment and growth would not be affected. But there have been short-run costs in terms of postponement of development expenditure by the World Bank and other international organizations in several sectors. Had such expenditure been incurred during 1998–9, it would have partially helped to overcome the current economic slowdown and could have pushed up GDP growth further by about 0.5 per cent.

Another factor that is holding back long-term investment is the indecisiveness of the policy makers. Investors are looking for clear and stable signals from the government about the policy environment in which they are expected to operate. This is necessary for the calculation of risk and profitability of investment decisions. At times certain actions by specific wings of the government provide substance to the fear of foreign investors that the reform process is not irreversible.

What Caused the Deceleration in Exports—Domestic Policies or the External Environment?

The economic reform process had the greatest impact on the international trade sector for some years. The huge inflow of foreign capital contributed towards the building up of foreign exchange reserves, as well as to capital formation. The share of foreign trade (exports and imports together) in GDP rose from about 14 per cent in 1991–2 to above 20 per cent in 1997–8 (Table 2.2). The Indian economy has become more integrated with the global economy.

The scenario in the external sector has changed from mid-1996 when merchandise trade growth fell drastically. Exports growth in dollar terms was only about 5 per cent during 1996–7 compared to above 20 per cent in the preceding year (See Table 2.3a). It fell further to 1.5 per cent during 1997–8 and has turned negative in the first half of 1998–9. Imports growth declined from 28 per cent in 1995–6 to range between 4 and 7 per cent in the following two years (Table 2.3b). Imports growth picked up moderately during the first half of 1998–9 and is expected to be about 10 per cent during the year. The fall in world market price for petroleum products have had a favourable effect in reducing the corresponding import bill by about $ 2 billion in 1997–8. Net receipts on the invisibles have continued to rise satisfactorily in recent years from less than $ 2 billion in the early 1990s to about $ 5 billion in 1995–6 and further to about $ 10 billion in 1997–8 (Table 2.4). This growth is largely due to rise in remittance income through official channels following the market determination of exchange rate and continued growth of software service exports. The growth in transactions of invisible has been a major source of support to our balance-of-payments situation.

The poor performance on the exports front led to a rise in the current account deficit (CAD) from below $ 5 billion in 1995–6 to almost $ 7 billion in 1997–8. It is expected to rise further during 1998–9. As a proportion of GDP, CAD turns out to be 1.7 per cent

TABLE 2.2

Selected Indicators for the External Sector

(as percentage of GDP)

	1991–2	1992–3	1993–4	1994–5	1995–6	1996–7	1997–8
Exports	6.7	7.1	8.1	8.1	8.9	8.6	8.3
Imports	7.7	9.4	9.6	10.9	12.0	12.3	12.2
Trade balance	–1.0	–2.2	–1.5	–2.7	–3.1	–3.7	–3.9
Current account balance	–0.3	–1.7	–0.4	–1.0	–1.6	–1.1	–1.6
External debt	37.7	36.6	33.1	30.0	26.3	23.8	23.8

Source: *Economic Survey* (1998–9). The calculations are based on the new GDP series.

TABLE 2.3a
Exports of Principal Commodities

(in US $ million)

	1990–1	1991–2	1992–3	1993–4	1994–5	1995–6	1996–7	1997–8
Primary products	4324	4132	3874	4916	5214	7257	8035	7470
Agriculture and allied products	3355	3203	3136	4028	4226	6082	6863	6404
Ores and minerals	970	930	738	16,657	20,404	1175	1172	1066
Manufactured goods	12,996	13,149	14,039	1300	1611	23,503	24,613	25,430
Leather and manufactures	1430	1269	1277	1478	1955	1731	1580	1443
Chemicals and related products	1307	1480	1229	3039	3508	2359	2690	3120
Engineering goods	2123	2253	2481	4726	6327	4391	4963	4982
Textile fabrics and manufactures	3776	4005	4294	1537	2234	7199	7810	8047
Gems and jewellery	2924	2738	3072	398	417	5275	4753	5116
Total Exports	18,143	17,866	18,537	22,238	26,331	31,797	33,470	33,980

Source: Directorate General of Commercial Intelligence and Statistics, as reported in *Economic Survey* (various issues).

TABLE 2.3b
Principal Imports

(in US $ million)

	1990–1	1991–2	1992–3	1993–4	1994–5	1995–6	1996–7	1997–8P
Bulk consumption goods	551	274	507	326	1144	970	1214	1364
Petroleum, petroleum products	6028	5364	6100	5754	5928	7526	10,036	8217
Fertilizers	984	954	978	839	1052	1683	911	1104
Capital goods	5832	4233	4531	6243	7638	10,331	9922	9187
Pearls, precious & semi-precious stones	2083	1957	2442	2634	1630	2106	2925	3143
Chemicals	1276	1379	1428	1371	2137	2106	2925	3143
Total Imports	24,073	19,411	21,882	23,306	28,654	36,678	39,132	40,779

Note: P = Provisional

Source: Directorate General of Commercial Intelligence and Statistics, as reported in *Economic Survey* (various issues).

TABLE 2.4
Balance of Payments

(in US $ million)

Items	1990–1	1991–2	1992–3	1993–4	1994–5	1995–6	1996–7	1997–8	1998–9(P) Apr.–Sep.*
Current Account									
Exports (f.o.b.)	18,477	18,266	18,869	22,683	26,855	32,311	34,133	34,849	16,634
Imports (c.i.f.)	27,914	21,064	23,237	25,069	35,904	43,670	48,948	51,126	24,712
Trade balance	–9437	–2798	–4368	–1285	–9049	–11,359	–14,818	–16,277	–8078
Invisibles (net)	–243	1620	842	1228	5680	5460	10,321	9804	4993
Current account balance	–9680	–1178	–3526	–1158	–3369	–5859	–4494	–6473	–3085
Capital Account									
Total capital account	7188	3968	2966	9835	9156	4678	11,287	10,984	–
External assistance, net	2210	3037	1859	1901	1526	883	1109	899	–135
Foreign investment, net	102	139	555	4235	4807	4604	5838	4993	707
Private transfers, net	2069	3783	3852	5265	8093	8506	12,367	11,830	5269
NRI deposits, net	1536	290	2001	1205	172	1103	3350	1125	–393
Overall balance	–2492	–2790	–560	8677	5787	–1221	6793	4511	

Note: P is provisional.

Source: *RBI Annual Report*, 1997–8.

**Economic Survey*, 1998–9.

in 1997–8 and might be regarded as well within viable limits. Total net flows on capital account (including foreign investment and commercial borrowings) stood at about $ 11 billion during both 1996–7 and 1997–8. Foreign exchange reserves increased by the difference between net capital account flows and CAD. By the end of 1998, they stood at about $ 30 billion, which could finance about 9 months' import bill.

The effect of the East Asia turmoil has been felt in the exchange rate market in India. The nominal exchange rate of the rupee against the US dollar remained fairly stable in 1996–7 moving within a narrow band of Rs 34.24 to Rs 35.87 during the year. It came under downward pressure in August 1997, when it experienced a mild contagion effect of the currency crisis in East Asia. There was renewed pressure in November 1997, triggered by the continuation of the East Asia crisis as well as political uncertainty in the wake of elections in the country. The depreciation continued in the first five months of 1998–9 with the exchange rate moving up above Rs 42 per US dollar in August 1998 and has remained stable since then.

The depreciation in 1997–8 in effect corrected an appreciation in the real effective exchange rate during the previous year owing to the inflation differential between India and its major trading partners. But the authorities felt that a further fall in the value of the rupee would be a cause of concern. In order to reduce the volatility of the exchange rate, the RBI intervened in the foreign exchange spot and forward market on several occasions. It has also deployed a range of monetary measures recently to counter speculative pressures in the foreign exchange market.

Exchange rate uncertainties adversely affected the unstable components of capital flows comprising portfolio flows and short-term credits, while FDT flows and medium- and long-term foreign commercial borrowings remained relatively unhurt. This led to an increase in the share of the stable component in capital flows from 63 per cent in 1996–7 to 85 per cent in 1997–8 (RBI Annual Report, 1997–8).

Exports account for about 8–9 per cent of GDP and played an important role in the high growth phase during this decade. They grew by 18–20 per cent (in dollar terms) during 1993–6 but there has been virtually no growth during the last two years. If we succeed in reverting to an export growth rate of 12 per cent or more, an additional GDP growth of 1 per cent could easily materialize. Indeed, the effect could be larger if we take into account the backward and forward linkages of export goods on the upstream and downstream industries. Since about three-quarters of our exports are in the form of manufactured goods, this additional growth effect would mostly be felt in the industrial sector by about 3 per cent or so. This indeed is the area that calls for immediate attention from policy makers.

What measures can we take to boost our exports? A very competitive price for producers through a proper exchange rate policy did help maintain the high export growth regime in the late 1980s and mid-1990s. The real appreciation of the rupee during 1996 and most of 1997 coincided with a downturn of export growth. It has been corrected with the depreciation that took place in 1998. The authorities should let the exchange rate of the rupee settle at the market-determined rate so that there is a built-in correction mechanism. Defence of the nominal exchange rate might lead to further worsening of export performance. Of course, the RBI must intervene to check large volatile behaviour and induced bubbles as in August 1998.

Between June 1997 and November 1998, the currencies of most East Asian countries depreciated by 30–5 per cent against the US dollar (69 per cent in case of Indonesia). The depreciation of the rupee has been about 15 per cent over the same period. Thus, compared to the East Asian countries, the rupee appreciated and Indian exporters lost competitive advantage. Depreciation of a country's currency gives exporters a price advantage in the international market. It tends to raise prices of its tradeable relative to non-tradables and to reallocate resources towards export goods if world prices remain fixed. It also leads to a rise in prices of imports and a decline in the relative profitability of import dependent sectors. Hence the right strategy to promote exports would be to permit an import neutral devaluation, i.e. a devaluation measure that is accompanied by tariff reductions so as to leave import prices unchanged. India would not gain by keeping its currency overvalued *vis-a-vis* its major trade competitors in the export market.

The share of East Asia in India's total exports has been around 15 per cent.[3] It marginally declined during 1997–8. Given the small share, the direct effect on our exports to East Asia crisis could not be very large. The effect is somewhat larger if we include Japan, which accounts for about 6 per cent of India's exports. But what could be more of a concern is the indirect effect arising from a loss of competitive advantage in the rest of the world market. The sharp depreciation of the currencies of competitors in East Asia could adversely affect India's exports to other economies. Fortunately, the rupee seems to have partly recovered from this disadvantage because of some appreciation in East Asian currencies towards the end of 1998.

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[3] The OECD countries account for 55 per cent of India's exports and 50 per cent of its imports.

We need to set our priority items on the basis of our competitive advantage in the long run and concentrate on quality and pricing of these items to capture a significant share of the world market. There is also an urgent need to develop fast track infrastructure facilities in export processing zones.

Inflation Control: Can Monetary Policy be Effective in All Situations?

The rate of inflation, as measured by the rate of growth of the wholesale price index (WPI) has come down steadily from a peak of 13.7 per cent in 1991–2 to 4.8 per cent in 1997–8 owing to various demand and supply side measures. An important aspect of inflation in the 1990s is that the prices of primary articles, such as foodgrains have contributed significantly to the overall inflation compared to the 1980s. This is borne out by the fact that while the contribution of primary commodities in the annual average rate of inflation was about 30 per cent for the 1980s, it was around 36 per cent for the period 1990–5 and 33 per cent for the period 1995–8. Since April 1998 there has been a significant increase in prices of primary articles, specially those of essential food commodities, with the annualized rate of inflation touching a peak of 16.9 per cent in November 1998. It came down thereafter with an improvement in the supply situation.

While the success of government policies in controlling inflation is visible in terms of decline in the overall WPI, it is not readily observable from the consumer price indices (CPIs) which have declined much less sharply. This is due to the fact that primary articles, whose prices went up at a higher rate than other commodities, receive a higher weight in the calculation of the CPI. As pointed out earlier, the moderation in the WPI and CPI, owing to tight monetary policies pursued since 1995–6, has also been associated with a decline in the growth of industrial output. The authorities seem to be aware of the adverse impact of a tight monetary policy on growth and they have made a conscious choice in favour of lower inflation, even at the cost of low growth. This brings us to an important question regarding the effectiveness of monetary policy in controlling inflation under all circumstances and the optimality of such a policy from the point of view of the welfare of the people.

Central banks all over the world control money supply to control inflation assuming that a general increase in prices, caused either by supply or by demand related factors, cannot be sustained over a period of time without subsequent increases in money supply. In this sense sustained inflation is always and everywhere a monetary phenomenon. Assuming that the public's demand for money is a stable function of income, they argue in favour of targeting money supply to control the rate of inflation. Thus the argument goes, while a contractionary monetary or credit policy leads to some output losses in the short run by stabilizing the inflationary expectations, it promotes long-run growth. Therefore, while there is a trade-off between output and inflation in the short run, there may not be one in the long run.

In the context of the experience of the Indian economy during the 1990s, however, the above discussion raises two important questions that have received little attention in policy circles. One is that in an economy in which a significant portion of inflation is generated by changes in administratively controlled prices, can monetary policy control inflation without substantial output losses? The other is whether the effects of monetary policy on output and prices are the same over various phases of business cycles. If the increase in overall prices is caused by a rise in agricultural prices generated by an increase in procurement or minimum support prices, a tight monetary policy has limited scope of controlling inflation as a significant proportion of the price rise is 'mandated' and relatively insensitive to changes in money supply. While it is still true that to the extent a tight money policy slows down growth in 'industrial' prices and the overall inflation, it would also be associated with substantial output loss in the short run. This is because the fall in aggregate demand associated with the monetary contraction, coupled with adverse terms of trade against industry, reduces industrial profitability and results in a fall in investment and output. Similarly, if monetary policy has a relatively weaker (stronger) effect on prices (output) during the low growth phase than during the high growth phase, monetary contraction to control inflation during the 'downward phase' of the growth cycle can cause substantial losses in output. In either case, the resulting output losses to attain a targeted level of inflation will be much higher than typically expected. Empirical econometric analysis of the Indian data supports this argument and highlights the possibility that a contractionary monetary policy aimed at controlling overall inflation, during a low growth phase associated with agricultural price rise, may result in significant and persistent output losses.

If the monetary authorities are aware of the adverse impact of monetary tightening on industrial output in making the choice to control inflation, the next logical question would be whether such a policy is optimal

Box 1

Fiscal Deficit Target

Fiscal deficit is the excess of expenditure of the government over its income and measures the borrowing of the government. The appropriateness of a particular level of fiscal deficit is monitored by expressing it as a proportion of GDP at current market prices. The calculation of this ratio has substantially changed due to new coverage of both fiscal deficit and GDP in early 1999 in India.

First, the Central Statistical Organization, the official agency in charge of GDP computation, has revised the GDP series from the earlier base of 1980–1 to a new base of 1993–4. The new series not only gives appropriate weights to emerging sectors like electronics and information technology, but it is also based on new updated productivity factors to compute income where direct information is not available. The new series thus shows GDP to be about 9 per cent higher than the old series.

Second, the central government has abandoned the practice of treating involuntary small savings deposits in its department on the same footing as its market borrowing. Three-quarters of small savings are actually received by the states and the central government was preforming only an intermediary role. This constitutes borrowing by the states (and not by the centre) and should actually be considered as deficit of states. Both the centre and the states would now directly borrow from a small savings banking organization. This new budgetary practice would reduce the centre's fiscal deficit by about Rs 25,000 crore amounting to about 1.25 per cent of GDP.

As a result of these two more appropriate accounting procedures, the fiscal deficit of the central government is budgeted to come down from about 6 per cent of GDP to 4 per cent and there is a primary surplus instead of a deficit in the central budget for 1999–2000. It is worth noting here that if the new procedure is adopted the gross primary deficit of the centre was around 3.0 per cent of GDP in 1990–1. By 1995–6, the last year of Manmohan Singh as Finance Minister, it had turned into a small surplus and remained so in 1996–7, the first year of Chidambaram. But with the pay revision of its employees, the government seems to have lost control over its non-committed expenditure in the last two years.

Does all this mean that the fiscal deficit scenario has improved significantly? The answer is clearly negative. The total fiscal deficit of the central and state governments put together has not changed under the new procedure. Though the fiscal deficit to GDP ratio has come down a bit with the new series of GDP, it is not licence to increase fiscal deficit in future. It still remains high at about 8 per cent of GDP. The acceptability of a particular level of fiscal deficit to GDP ratio depends on the macro implications of the fiscal deficit which remain the same—the high inflationary impact, high interest payments on market borrowings by the government, and crowding out of resources available to the private sector. The present level of fiscal deficit is too high especially because about half of it is financing current consumption. A moderate level of fiscal deficit to finance government investment can be justified in a developing economy. The level should be decided by considering the trade-off between the social productivity of investment and the potential inflationary impact. But continued fiscal deficit to finance current expenditure cannot be justified.

vis-a-vis a policy that allows for a little higher inflation but more growth. The monetary authorities typically argue that 'inflation' control, even at the cost of short-run output losses, is desirable for (i) attaining stable long-run growth by stabilizing inflationary expectations, and (ii) protecting the real incomes and welfare of relatively 'poor' sections of the population. As pointed out earlier, it is not clear whether a moderate rate of inflation has positive or negative effects on growth particularly when the economy is in the downturn of a growth cycle. In fact, our empirical analysis shows that increase in prices have weak positive effect on industrial growth during the low growth phases. While there is some truth in the argument that inflation control is the best anti-poverty programme, it is not apparent that control of aggregate inflation by itself improves the welfare of the poor for the latter is closely related to the composition of inflation as well. For example, consider a situation in which overall increase in prices is caused by increase in agricultural commodity prices. If the monetary authorities tighten the supply of money and credit, it would lead to a fall in overall prices and industrial output. To the extent the 'poor' receive incomes from the industrial sector, their incomes are adversely affected by a contractionary monetary policy. Further, the increase in prices of agricultural commodities that constitute a major part of their consumption basket would reduce their real expenditure and welfare. Therefore, it is not clear whether a policy aimed at controlling overall inflation, without much attention to its structural causes and composition, would be superior to a policy that allows for a little higher inflation accompanied by higher growth. In the end, it should be pointed out that the objective of the above arguments is not to undermine the importance of monetary policy in stabilizing output and inflation, but only to highlight why the nature and objectives of monetary policy should be made context dependent.

Persisting Fiscal Deficits: A Major Problem

Gross fiscal deficit (GFD) refer to the excess of the government's total expenditure (including loan repayments) over non-debt receipts consisting of revenue receipts and capital receipts which do not create debt (e.g. sale of equities in public sector enterprises). Continued fiscal deficit at unsustainable levels creates macroeconomic instability and was considered a major weakness of the development strategy followed in the 1980s. Reduction in fiscal deficit to a sustainable level formed a significant component of the stabilization and reform process initiated in 1991. It is a matter of concern for the long-term macroeconomic stability that there has not been much success in controlling fiscal deficit. The gross fiscal deficit of the central and the state governments together continues to be about 8 per cent of GDP (Tables 2.5a and b). The reduction in fiscal deficit by about 2 percentage of GDP has almost entirely come from the central government. The slowdown in government revenue due to industrial deceleration has strained the fiscal deficit correction process further during the last two years.

TABLE 2.5a

Government Deficits: Central Government

(as a percentage of GDP)

Year	Gross Fiscal Deficit		Gross Primary Deficit		Revenue Deficit		Monetized Deficit
	Old Series	New Series	Old Series	New Series	Old Series	New Series	Old
1990–1	8.3	7.7	4.3	4.0	3.5	3.2	2.8
1991–2	5.9	5.4	1.6	1.4	2.6	2.4	0.9
1992–3	5.7	5.2	1.3	1.2	2.6	2.4	0.6
1993–4	7.4	6.9	2.9	2.7	4.1	3.7	0.0
1994–5	6.0	5.6	1.4	1.3	3.2	3.0	0.2
1995–6	5.4	4.9	0.9	0.8	2.7	2.4	1.8
1996–7	5.2	4.7	0.6	0.5	2.6	2.3	0.2
1997–8	—	5.7	—	1.5	—	3.0	0.9
1998–9 (RE)	—	5.8	—	1.5	—	3.4	—
1999–2000 (BE)	—	4.0	—	–0.4	—	2.7	—

TABLE 2.5b

Government Deficits: Centre and States

(as a percentage of GDP—old series)

Year	Gross Fiscal Deficit	Revenue Deficit	Net Primary Deficit
1990–1	10.0	4.5	4.9
1991–2	7.4	3.6	3.1
1992–3	7.4	3.4	2.6
1993–4	8.8	4.5	3.6
1994–5	7.4	3.9	2.2
1995–6	6.9	3.4	1.9
1996–7	6.8	3.8	1.9
1997–8 (RE)	8.1	4.4	2.8
1998–9 (BE)	8.0	4.6	2.5

Notes: (for Tables 2.5a and b)

RE: Revised Estimates

BE: Budget Estimates

Negative deficit figure indicates a surplus

Combined GFD refers to borrowing by centre and states minus net lending from centre to states.

Sources: Economic Survey, 1998–9 for New Series and *RBI Annual Report*, 1997–8 for other data.

New Series is based on 1993–4 as base

GDP for 1990–1 to 1992–3 in this series is as interpolated by the *Economic Survey*.

More worrisome is, however, the continuation of large primary deficit and revenue deficit in the economy (central and state governments put together). Primary deficit is obtained when interest payment is deducted from fiscal deficit on the grounds that the government is committed to pay interests on past debts and so a deficit on this account means that the government borrows even to finance other expenditure. There is urgent need to eliminate primary deficit, which is about 2.5 per cent of GDP at present, as a first step towards a sustainable fiscal regime. The central government intends to move towards a primary surplus during 1999–2000 as per the budget estimates, mainly owing to an overdue adjustment on small savings. But the state governments have not yet shown concern about removing primary deficit. Next, attention should be devoted to removing revenue deficit that represents excess of current expenditure over current revenue. It ranged between 3.5 and 4.5 per cent of GDP in recent years. A surplus on the current account would mean government borrowings, if any, are primarily for investment purpose and not for consumption and other current expenditure of the government. When primary and current deficits of the government are removed, continuation of the fiscal deficit could be judged on the basis of the social productivity of public investment.

The government has, however, met with some success in controlling monetized deficit, i.e. deficit financed by printing money. As a proportion of gross fiscal deficit, it has decreased from an average of 28 per cent during the second half of the 1980s to 12 per cent during 1991–7. One noteworthy recent development in this context has been the discontinuation from April 1997 of the practice of issuing unlimited *ad hoc* treasury bills which were the major instrument of government borrowing from the RBI. A system of Ways and Means Advance (WMA) with mutually agreed upon prior limits has been introduced to meet temporary mismatches in receipts and expenditures of the central government. During most of 1997–8, the government did not resort to WMA due to strong money market support to government borrowing. But it has not been as fortunate during 1998–9.

Government revenue has not been keeping pace with GDP over the years. Central government indirect tax revenue as a proportion of GDP has fallen by about 2 percentage points from about 9 per cent in the early 1990s due to moderation of customs tariff associated with trade reforms and certain rationalization of excise duties. Direct taxes, which account for only a small fraction of total tax collection, have improved well and have partially neutralized the fall in indirect tax revenue. The tax revenue collected by the states has remained nearly constant at a little below 6 per cent of GDP. On the whole, the tax revenue of central and state governments together has fallen by about 1 per cent of GDP during the 1990s to remain at about 15 per cent recently.

Turning to the government expenditure side, the government has failed to achieve the objective of contraction in expenditure under several heads of concern. The burden of interest payments continues to be large at above 4 per cent of GDP. This is the largest single item of government expenditure and at present accounts for about two-thirds of tax revenue of the central government net of states' share. Total outstanding liabilities[4] as a percentage of GDP have come down from 60 per cent of GDP in 1990–1 to 56 per cent in 1997–8. Despite this development, the interest burden has not dropped because the government has started paying market interest rates on its domestic borrowing. It was thought that if the government were to pay the market rate of interest, it would behave more responsibly and prudently. Unfortunately government borrowings seem to be completely insensitive to the increases in interest rates. In any case, this has added to the interest burden on the government. The present nominal rates of about 12 per cent would seem to be high in a low or moderate inflation regime of 4–6 per cent. A better policy for the government might be to permit a long-term real return of about 3 per cent on safe investments like government borrowing.

The socio-political constraints have led to only partial success in reducing government explicit subsidies by about 0.8 per cent of GDP from 2.1 per cent in 1990–1. Explicit subsidies are, however, only a small component of the total subsidies in India. The hidden subsidies are indeed large and worrisome. A recent study has estimated the total subsidies by central and state governments to be as large as 14.4 per cent of GDP in 1994–5, consisting of 3.7 per cent on what they define as 'merit' goods and 10.7 per cent on 'non-merit' goods (GOI, 1997 and NIPFP, 1997). The distinction between merit and non-merit goods was made on the basis of extent of externalities where social benefits exceed the private benefits. Thus primary health care, sanitation, and environmental protection would fall in the list of 'merit' goods while electricity, fertilizer, and higher education are treated as 'non-merit' goods. Subsidies on merit goods are justified on economic grounds. But those on non-merit goods should and must be introduced on a very selective basis after examining the extent to which social benefit exceeds private benefits. There is great scope for reducing non-merit subsidy and, if effectively carried out, it could help to go a long way in reducing fiscal deficit.

Subsidy reduction calls for a political consensus. Otherwise, successive governments find it convenient to resort to 'competitive subsidies' to please different organized pressure groups in a democracy. However, even when politicians want to safeguard interests of certain vulnerable sections of the society through subsidies, there is scope to do so with minimum harm to the efficiency of the economy. For example, studies at the IGIDR have shown that if fertilizer subsidy is removed and the money thus saved is invested to subsidize farmers for pump sets, agricultural income rises (Parikh et al., 1997 and Narayana et al., 1990). In other words, politicians willing to champion farmers' cause could do so more effectively by reallocating subsidies from one form to another.

Another point to note is that, contrary to popular belief, expenditure by central and state governments on the social sectors (health, education, rural development, and food subsidy) has not declined in recent years compared to the late 1980s. It had declined in the initial two years of the reforms but rose later to remain at about 7.5 per cent of GDP as per RBI estimates. The capital expenditure of the government has fallen by about 2.5 per cent of GDP from a level of about 6 per cent in 1990–1. This reflects the new philosophy of the government moving away from direct production in several sectors. While the move to free the government from certain activities better carried out by the private sector was meant to bring about more efficient utilization of resources, there are certain infrastructure sectors where government withdrawal has not witnessed corresponding replacement by the private sector.

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[4] The bulk of total outstanding liabilities is internal since external liabilities constitute only about one-sixth of the total.

How do we correct fiscal deficit?

Correction of fiscal deficit involves large-scale reallocation of government income and expenditure. It affects the welfare of several sections of the population. Further, the effects are not the same for all sections, some might gain while others might lose. Successful fiscal correction measures thus must be carried out in a manner that enhances growth and equity within the socio-political constraints. Against the above developments in public finance and the current stage of the development of the Indian economy, we suggest a multi-pronged strategy to correct fiscal deficit.

- First, subsidies on non-merit goods are indeed huge in India as discussed above. It is difficult to bring about a sudden and substantial reduction in them and governments have been forced to roll back on their attempts to do so in recent years. At the same time, it would be nearly impossible to restructure government expenditure in a meaningful way if the present recovery rates continue in future for non-merit goods. One way of reducing these subsidies would be to increase user charges slowly every year so as to keep the absolute level of subsidies fixed in nominal terms. Once they are brought down to a sustainable level, say to about half the present level of 11 per cent of GDP, user charges should be increased thereafter at the same rate as inflation rate.

- Second, the savings made from such reduction of non-merit subsidies should partly be used to reduce fiscal deficit. The other part should be used to enhance government expenditure in infrastructure and social sectors. In particular, government should expand the employment generation programmes so that the poor are provided a safety net from the adverse effects of fiscal adjustment.

- Third the government should examine more carefully the possibility of using proceeds from the disinvestment in public sector enterprises to retire parts of government debts, especially those that involve high interest rates. This would reverse the increasing interest payments burden.

- Lastly, as discussed earlier, governments should adopt a sequencing procedure that eliminates the primary deficit first, the revenue deficit next, and judges continuation of fiscal deficit taking into consideration social returns on public investment.

AN ASSESSMENT OF THE LONG-TERM GROWTH PROCESS

We have analysed above the major macroeconomic concerns facing the Indian economy at present. These relate to the revival of the economy in the short run. We now turn to longer run issues of efficient resource allocation and sustainability of the growth process.

The GDP growth rate in the medium run has been higher by about 1 percentage point after the initiation of reforms. This indicates only moderate success of the reform measures. The effects of the reforms should, however, be judged by the character of the growth process. After all, the economy had a higher growth rate even in the 1980s compared to the so-called Hindu growth rate of 3.5 per cent during the previous three decades. One major criticism of the growth process of the 1980s was on the grounds of sustainability, in so far as it involved a high fiscal deficit that put pressure on inflation and balance of payments. Another criticism was that the 'licence-permit raj' involved wide bureaucratic control of production and trade activities which more or less continued with only marginal relaxation and led to inefficient utilization of resources. As a result, the economy failed to realize its full growth potential, given that our overall savings rates were well above 20 per cent for more than a decade before the reforms. We now consider these two points.

Realization of the higher growth was considered important to raise the standard of living of various sections of the people and to make a significant impact on the removal of mass poverty. The economy appears to be moving towards realizing this potential despite short-term setbacks. The deregulation process has removed entry barriers and has brought in increased competition from domestic sources. At the same time, liberalization of the import regime has brought in external competition. The effect of competition is best reflected in the movement of relative prices of manufacturing goods which have fallen considerably, especially in the capital goods sector.[5] The consumers of

[5] This is also expected from general equilibrium simulation runs relating to trade liberalization. See Parikh et al. (1997).

manufactured products are the major winners of the liberalization process.

Prior to the reforms the economy registered a GDP growth rate of above 6 per cent mostly due to the low base of the previous years associated with bad rainfall (the year 1989–90 being an exception to this rule). Efforts to put the economy on a higher growth path appeared to have been successful for several years in succession in this decade. We strongly believe the Indian economy has reached a stage that could very well yield a long-term growth rate of 7 per cent or above, provided the right kind of policies are employed to realize this potential. The current slowdown in the economy should be viewed as a temporary phase and not as an indicator of a long-term path. This view broadly reflects a wider consensus since a growth rate of 5–6 per cent is no longer taken as an indicator of satisfactory performance of the economy by industrialists and policy makers.

One key question is whether we have the necessary resources to support this growth target. Household savings in India have remained in the range of 18–20 per cent of GDP which is high by comparison with other countries at a similar stage of development. The overall domestic savings rate, which includes savings from corporate and government sectors, has been above 24 per cent in recent years, but could go up further by 2–3 per cent with continued fiscal reforms, especially in areas like reduction in current account deficit and reforms in public sector enterprises.

The investment rate could rise over and above the domestic savings rate due to net foreign capital inflows, which constitute foreign savings. India could target net foreign investment flows (FDI, portfolio investment, and medium-term commercial borrowing) of about US $ 10–12 billion per year in the coming years. The reforms undertaken have put the economy in a strong position to attract foreign investment of $ 7–8 billion. Further liberalization of the insurance sector is under active consideration at present. This along with certain policy measures in the areas of infrastructure financing could help us achieve the above foreign investment target. Though substantially less than foreign investment (especially FDI) flows of about $ 30–40 billion to China, this amount could contribute to raising our investment rate by about 3 per cent of GDP. Investment rates of 28–30 per cent of GDP could support GDP growth of above 7 per cent even at the current level of efficiency in capital utilization.

Now to turn to the sustainability issue which has several dimensions. An essential requirement for sustainable growth is that the pattern of financing of investment does not lead to external or domestic payment crisis. Another dimension of sustainability is related to possibilities of infrastructure bottlenecks that might halt the growth process. Lastly, a stable socio-political environment is an integral part of sustainability in so far as it plays a vital role in providing right and consistent set of signals to investors.

The reform measures since 1991 have brought about changes in the present pattern of financing growth compared to those followed in the 1980s. First, the expansionary fiscal policy of the 1980s is no longer considered by the government as a viable long-term option. This realization is important. The central government has moderately succeeded in reducing its fiscal deficit, though further action as already outlined is urgently needed, especially at state levels. Second, monetization of government debt is now limited by mutually agreed upon ceiling on the central government debt from the RBI at the beginning of the year. Price rise arising from one source of unanticipated excess money supply could be under control. Third, FDI is becoming a major component of foreign capital inflow. It not only bears the risk of investment decisions but is not easily reversible and hence stable. These developments indicate that the present mode of financing of investment represents a move towards sustainable development. Extension of the reforms process to the unfinished fiscal and financial agenda could further consolidate this move.

Lastly, we must draw attention to the present socio-political environment of decision making in the country. Two different coalition formations have governed the country since 1996. Various partners in the coalition have been advocating policy changes which are at times contradictory. This creates a credibility problem for announcements made by the government. Not only have some reform bills been pending in Parliament, but certain decisions relating to reforms have also been reversed in recent months. The government has also been seen at times to reconcile with the so-called 'swadeshi' lobby which has been arguing for preference to domestic producers and higher tariffs on imports. Such actions provide substance to the fear of foreign investors that the reform process is not irreversible. Credibility is a crucial component of any reform measure. It is time all the major political parties spelt out a minimum consensus on the reform measures to create a better investment climate that is not so dependent on political compulsions and changes in government.

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3 Persisting Poverty and Social Insecurity A Selective Assessment

S. Mahendra Dev and Ajit Ranade

INTRODUCTION

One of every three persons in India is officially poor,[1] and two of three are undernourished or malnourished.[2] If you count those who are deprived of safe drinking water, adequate clothing, or shelter, the number is considerably higher. Finally, if you also include people who are 'above' the officially defined poverty line, but are vulnerable, in the sense of not being adequately insured against rising prices, unemployment, illiteracy, declining incomes, old age, and disease,[3] you get a huge majority. A recent Human Development Report ranked India's development index at 138 out of 175 countries. A World Bank report predicts that most of the world's poor will reside in South Asia by 2020. A comprehensive analysis of the determinants and causes of poverty, its evolution, its short-term alleviation and long-term eradication strategies,[4] and discussion of the related issue of what constitutes development and well being, and how it should be meausured, are beyond the scope of the present chapter. Instead we focus on a few specific issues related to the reforms process and how it has affected the poor and the vulnerable.

Much has been written on Indian poverty and attempts at its alleviation. For the present we will skirt many important issues of measurement of poverty, aggregation of numbers, choice of calorie norm, utilitarian versus welfarist views, and so on.[5] In this chapter we mainly focus on the rural poor, although we also examine the condition of various other vulnerable groups. With economic reforms, the terms of trade seem to be shifting in favour of agriculture. It is important to examine the impact of these improving terms of trade (through higher agricultural prices) on the poor.

We also look at strategies to alleviate poverty in the short run, which are typically labour market interventions (wage employment programmes) and credit market interventions (rural credit programmes). Longer-term strategies necessarily include growth-inducing investment in agriculture and rural areas. It is also possible that the labour market and land distribution conditions in rural areas are such that a long-term growth strategy might also not be enough, and would require a resdistributionary component such as land reform as well. In this chapter our analysis is mainly expository and our aim is to raise some issues and review the recent performance of relevant public policy and to answer the following questions:

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[1] This roughly assumes a poverty line of daily consumption expenditure of (PPP adjusted) a dollar a day. Purchasing power parity (PPP) adjustment of the rupee–dollar exchange rate takes care of real purchasing power of a rupee, as against the nominal exchange rate. If one uses a nominal exchange rate of Rs 40 to a dollar, then the non-PPP adjusted *per capita income* of India is roughly a dollar a day. That would make *all* Indians below an official poverty line of a dollar a day.

[2] This is based on NSSO data, assuming a calorie adequacy of 2400 calories a day, and also various health surveys.

[3] These would include people such as subsistence farmers, casual labourers, widows, the elderly, or child labourers. These issues of social insecurity are disccused in the sixth section in this chapter.

[4] Transient poverty perhaps can never be eradicated, since some people will invariably fall in and out of poverty due to the vicissitudes of fate. But chronic poverty can be reduced and eliminated by sustained public action, and it is widely accepted that removal of chronic poverty will entail expanding opportunities for income generation through economic growth.

[5] It would not be possible to provide here a comprehensive bibliography for reseacrh on Indian poverty. An early reference is Dandekar and Rath (1971). For conceptual issues see Ravallion (1994), Lipton and Ravallion (1995), Drèze and Sen (1989). For some summary information on some of the numbers we have discussed here, see also Dev and Ranade (1997).

1. What are the recent trends in poverty?

2. What is the impact of rising agriculutral prices on the consumption and wages of the poor, and how have they coped? What is the supply response to these imporved terms of trade for agriculture?

3. Among the various strategies for poverty redressal, how have employment programmes fared and what have we learnt? How does the public food distribution system compare with wage employment programmes?

4. What is the prognosis for growth in agriculture, which is where most of the chronically poor work?

5. What are the other dimensions of social insecurity and what can be done about them? In particular, how have the elderly, widows and child labourers fared?

Economic reforms initiated in 1991, which have included liberalization and deregulation along with structural adjustment, were directed at industry, trade, banking, capital markets, exchange rates, taxation, public finance, and infrastruture. The impact on agriculture has been indirect. However the reforms have had a considerable impact on the poor, be they in the cities or rural areas, be they employed in agriculture or industry or services. Here we remark that economic growth and increases in standards of living are almost always associated with a rapid decline in the number of persons working in agriculture. In fact by the 1990s the developed economies had a tiny fraction of their labour force in agriculture, e.g., USA (3 per cent), Japan (7 per cent), Austria (8 per cent), and Ireland (11 per cent). Hence economic growth which can absorb labour into industry and the services sector is the process by which a substantial decrease in poverty can be attained. As is well known from international evidence and illustrated by Table 3.1, removal of poverty has involved absorbing an increasing fraction of the labour force into non-farm activity and increasing the productivity of agriculture. India has failed on this count, even in comparison to South East Asian countries, which had per capita GDPs similar to India's in the early 1960s. In the mid-1990s India has two-thirds of its labour force working in agriculture, contributing (or earning) less than 28 per cent of national income.

This chapter is organized as follows. In the second section we review some recent poverty estimates and trends. In the next section we discuss the link between higher agricultural prices and rural poverty. We particularly look at the arguments of long-term supply response to better terms of trade for agriculture, and changing consumption patterns of the poor. In the fourth section we look at a specific poverty alleviation strategy, namely employment programmes, and review its performance and experience. Long-term poverty alleviation can, however, only be achieved through economic growth and productivity. The fifth section reviews the prospects for growth in agriculture. The sixth section contains a discussion of other aspects of social insecurity. In particular we look at three vulnerable groups, the elderly, widows, and child labourers. The last section has concluding comments.

TABLE 3.1

Comparison of Per Capita Income and Labour in Agriculture

Country	Per capita income (1987 prices in USD)		Percentage of labour in agriculture	
	1960	1964	1960	1990
Nepal	148	203	95	94
India	206	407	75	64
China	75	435	83	72
Indonesia	190	676	75	55
South Korea	520	5210	61	18
Malaysia	708	2905	63	27

Source: Human Development Report, 1997.

RECENT POVERTY ESTIMATES AND TRENDS

In India there has now been a long enough tradition of data collection at household level, its analysis, and poverty measurements, most notably typified by the nationally representative sample surveys undertaken and statistical analyses and documents published by the National Sample Survey Organization (NSSO). There is also a vast literature on poverty measurement in India and the attendant issues of public policy.[6] In this section we review the recent evidence on poverty (head count ratio), employment, wages, and inequality.

Poverty Estimates

Indian poverty is predominantly in the rural areas where more than three-quarters of all poor people reside, although there is wide variation in poverty across different states (see Datt and Ravallion, 1997). Moreover progress in reducing poverty is also very uneven across different regions of the country. Rural poverty varied from 20 per cent in Punjab and Haryana to 63 per cent in Bihar in 1993–4. Similarly urban poverty varied from 12 per cent in Assam to 43 per cent in Orissa (see Table 3.2). This disparity in the incidence of poverty is much higher if we look at the NSSO classified

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[6] See Dev and Ranade (1997) for details. Also see Datt and Ravallion (1998), Datt (1997).

TABLE 3.2

Urban and Rural Poverty at State Level

State	Rural (per cent)			Urban (per cent)		
	Late 1950s	Early 1990s	Trend rate	Late 1950s	Early 1990s	Trend rate
Andhra Pradesh	65.14	35.89	–2.12	48.03	30.59	–1.50
Assam	39.92	49.33	0.46	15.53	11.95	–1.63
Bihar	64.52	63.20	–0.02	60.26	42.39	–0.86
Gujarat	56.77	41.77	–1.49	54.84	37.33	–1.28
Jammu & Kashmir	37.53	31.20	–0.51	33.09	14.01	–3.40
Karnataka	54.08	46.88	–0.64	53.19	34.09	–1.42
Kerala	69.18	33.01	–2.41	54.21	30.62	–2.06
Madhya Pradesh	56.68	49.79	–0.40	47.63	38.17	–0.87
Maharashtra	65.93	50.50	–0.99	43.47	37.47	–0.46
Orissa	60.86	34.66	–1.47	58.05	43.31	–0.95
Punjab and Haryana	31.24	20.64	–1.92	36.51	13.64	–3.06
Rajasthan	46.36	45.79	–0.54	45.18	29.50	–1.42
Tamil Nadu	69.65	41.80	–1.45	46.60	31.87	–1.10
Uttar Pradesh	47.38	41.72	–0.70	59.44	39.35	–1.11
West Bengal	50.33	31.51	–1.74	28.34	23.79	–0.56
All India			–0.86			–0.75

Notes:

1. Late 1950s refers to the average over 1957–8 to 1959–60.
2. Early 1990s refers to the average over 1990–1 to 1993–4.
3. Rates of Growth are annual trend rates of growth estimated from regressions of log poverty measures on the mid-point of the survey period of each NSS round.

Source: Datt (1998).

sixty-six agro-climatic regions instead of states. Dubey and Gangopadhyay (1998) estimated head count ratios for these regions for 1987–8 as well as 1993–4. Using the Expert Group methodology (Dubey and Ganagopadhyay, 1998, n. 2.1), they found that for fifty-eight major regions, rural poverty varied from 5 per cent in northern Punjab to 69 per cent in southern Orissa in 1993–4. Similarly in urban areas it varied from 5 per cent in Assam hills to 67 per cent in southern Uttar Pradesh. It may also be noted from Table 3.2 that the progress in reduction of rural poverty has been as dramatic as 2 per cent per annum in Kerala and Andhra Pradesh, and almost zero in Bihar.

How have economic reforms affected the poor? This has attracted much commentary and analysis. In this context it is useful to look at both pre- and post reform poverty estimates. At the outset it may be mentioned that we have very few data points to analyse changes in poverty in the post-1990s, the latest NSS round being the fiftieth round of 1993–4. However, some trends can be discerned with the available data. For this purpose, we concentrate here mainly on the poverty estimates based on Expert Group methodology.[7]

The estimates based on thin sample surveys carried out every year by the NSSO show that rural and urban poverty increased significantly during the first eighteen months of the reform period (see Sen, 1996 and Tendulkar and Jain, 1995). The comparison between pre- and post reform periods becomes more clear if we look at the estimates based on large sample surveys carried out every five years. The estimates based on the expert group method and approved by the Planning Commission are presented in Table 3.3. It shows that the 1980s recorded a faster decline in rural poverty and the decline slowed down considerably after the introduction of reforms (also see Rao, 1998). On the other hand, urban poverty showed faster decline in the post reform period. The absolute number of poor declined throughout the 1980s but it increased in 1993–4 for both rural and urban areas (see Table 3.4). The upshot of the argument is that after fifty years of Independence almost 320 million people, or around 36 per cent of total population, were below the poverty line.

It must be mentioned that in NSS surveys the affirmative response to the probing question, 'Do all members of your family get two square meals a day?'

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[7] An Expert Group set up by the Planning Commission under the chairmanship of Professor Lakadawala suggested the use of NSSO data and state-specific prices for computing poverty ratios rather than data from National Accounts Statistics and a single price level for all India. See Dev and Ranade (1997).

TABLE 3.3

Percentage of Population below the Poverty Line

Year	Rural		Urban		Total	
	Poverty ratio	Annual decline (in per cent)	Poverty ratio	Annual decline (in per cent)	Poverty ratio	Annual decline (in per cent)
1977–8	53.0	—	45.2	—	51.3	—
1983	45.7	3.24	40.8	2.25	44.5	3.11
1987–8	39.1	3.41	38.2	1.45	38.9	2.95
1993–4	37.3	0.78	32.4	2.71	36.0	1.29

Source: Economic Survey, various issues.

has gone up from 81 per cent in 1983, to 93 per cent at the end of 1993. Since our poverty line was originally determined mainly on the basis of income needed to meet 'minimal' food requirement, this large difference in the estimate of the poor and hungry is puzzling. Two possible explanations are: first, the minimal calorie norm was too high and that people feel that even with lower calorie intake they have had two square meals a day; second, our procedure for updating the poverty line does not take into account substitution in food consumption that is induced by relative price movement, and this may be important as it might imply that poverty estimates are overestimates.

Some trends that emerge from the assessment of all India poverty situation in the pre- and post-reform period are as follows:

(a) Rural and urban poverty increased during the first two years of the reform period.

(b) The phenomenon of faster decline of rural poverty in the 1980s has been halted in the post-1991 period. If we compare 1987–8 and 1993–4, the rate of decline in poverty has been much slower as compared to that of the 1980s.

(c) There has been a decline in the absolute number of poor in the 1980s. In contrast, the post-1991 period showed an increase in the absolute number of poor even if we consider the quinquennial surveys.

(d) Urban poverty declined much faster than rural poverty in the post reform period.

Thus the impact of economic reforms on the poor in India so far has been better than in some of the Latin American countries, but worse than in some of the East Asian countries.

Employment and Wages

There was apprehension that reforms would increase unemployment, but the evidence suggests that unemployment rates, measured both as 'usual status' and 'daily status' have not increased at the all India level,[8] between 1987–8 and 1993–4. However, there seems to be some decline in the growth rate of rural non-farm employment in the post reform period. Decline in public expenditure is considered one of the factors for this slowdown in the growth of rural non-farm employment.

On the real wage front, there had been significant increase in real wages for agricultural labourers in the 1980s. In the post reform period, the rate of growth in real wages for agricultural labourers has been lower than that for the pre-reform period. NSS data on the wages of casual labourers also show that real wage rates for casual workers grew much more slowly in the post reform period as compared to the 1980s.

Inequality

In the Indian economy, it is well known that inequality (measured by the Gini coefficient) in consumption expenditure is lower that in income, which in turn is much lower than inequality in wealth. NSS data capture inequality in consumption. The distributional impact of economic reforms is a hotly debated topic. In particular whether rising food prices (a fact of the post reform period) have had adverse distributional consequences is a controversial question. We examine this question in the next section. In this section we note some aspects of regional and sectoral inequality (see Table 3.4).

Datt (1998) and Datt and Ravallion (1997) have claimed that progress in reducing poverty (from around 53 to 35 per cent nationally over some forty years) has not increased inequality within the poor. In particular, they say, 'growth in average living standards also trickled down to the poor,...[and] benefits of growth accruing to the poor were not mitigated by adverse redistribution'.

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[8] 'Usual status' refers to the status of activity on which a person spent relatively longer time in the preceding 365 days. 'Daily status' refers to the status of activity each day of a reference week. In the category of rural males, 'daily status' unemployment has gone up between 1987–8 and 1993–4.

At the state level in 1993–4, the variation in rural Gini coefficient was between 19 per cent for Assam and 31 per cent for Madhya Pradesh, and for urban Gini it was between 28 per cent for Jammu & Kashmir and 39 per cent for Orissa.

RISING FOOD PRICES AND THE POOR[9]

How do rising food prices affect the rural poor, albeit in the medium to long run? We examine this question by looking at the analytical issues which link terms of trade with investment in agriculture, and theories that link wages to food prices. If better relative prices for agriculture leads to more investment and higher wages for agricultural labour, then the rural poor could be better off despite higher food prices.

The pre-reform regime has been characterized as biased against agriculture due to heavy protection to industrial goods, an overvalued exchange rate, and rigid controls on export, movement and price (through levies) of agricultural goods. Hence even though the structural adjustment that followed in the wake of economic reforms concentrated on industrial delicensing and liberalizing the foreign exchange regime, it did improve the terms of trade in favour of agriculture from 81 per cent to almost 99 per cent in terms of the 1970–1 levels.

TABLE 3.4

Head Count Ratio and Gini Coefficients, Urban and Rural

Year	HCR (rural)	HCR (urban)	Gini	
			urban	rural
1970–1	57.33	45.89	0.346	0.288
1972–3	57.21	47.00	0.345	0.305
1973–4	56.17	49.20	0.317	0.282
1977–8	54.47	42.86	0.337	0.312
1983	49.02	38.33	0.334	0.301
1986–7	45.21	35.39	0.356	0.302
1987–8	44.88	36.52	0.356	0.302
1988–9	42.23	35.07	0.356	0.295
1989–90	36.69	34.76	0.356	0.282
1990–1	37.48	35.04	0.340	0.277
1991	40.07	34.79	0.351	0.311
1992	46.12	36.37	0.356	0.298
1993	44.19	38.86	0.337	0.284
1993–4	39.65	30.94	0.345	0.285

Source: Tendulkar (1998).

These increasingly favourable terms of trade for agriculture can be expected to attract private investment into agriculture, thereby leading to growth in output and demand for rural labour. There is strong evidence of growth in private sector investment in agriculture especially since the late 1980s. Whether this increase in private investment alone can lead to sustained growth in agriculture remains to be seen. This is especially so in light of the complementarity between public and private investment, as manifested by the state of rural infrastructure, public irrigation, roads, and power. Thus even though the terms of trade are becoming favourable, and the 'prices are right', unless the non-price factors also become favourable, the impact on growth may be small.

A Theoretical Digression

Economic reforms have led to an increase in food prices. The explanations for this may be varied and sometimes contradictory,[10] but the crux of the matter is that economic liberalization along with structural adjustment has meant that input subsidies are lower and output (food) prices closer to international prices, which are typically higher than domestic prices. Has this resulted in a surge in demand for rural labour, and hence wages, to more than compensate for the rise in food prices?

In a closed economy model with two sectors (agriculture and industry), with two input factors (labour and capital), when output prices tilt in favour of agriculture (say due to liberalization), since agriculture uses labour more intensively, the price of labour (wages) rises faster than the price of capital, leading to more capital investment in agriculture. This is the 2 × 2 version of the famous Stolper–Samuelson theorem. The inapplicability of this model in the Indian context arises due to the fact that (a) agriculture is not a constant returns technology, (b) capital (and to some extent also labour) may not be mobile across sectors, and (c) factors are not fully employed, especially labour. Add a little more realism and you can come to a different conclusion; thus a 2 × 2 × 2 model (two goods, two inputs, and two classes of consumers, viz. the landless and landlords) that makes equally stringent assumptions, provides different insights.[11]

In the short run everybody is hurt by higher food prices. In the long run if real wages do not rise as fast as relative food prices then the poor are hurt, since they consume a greater portion of their (real) income as food (Engel's Law, see next section). It is theoretically possible that in the absence of any technological improvement and investment in agriculture, for which there may be no endogenously created private incentives, real wages can remain permanently stagnant, even when the relative profitability of the agriculture sector as a whole is rising. In fact stagnant real wages can coexist with increasing employment in agriculture.[12]

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[9] The material in this section is drawn from Dev and Ranade (1998).

[10] See Sen (1996) and Tendulkar and Jain (1995) for two such explanations.

[11] See Eswaran and Kotwal (1994)for a lucid description of the application of this model to India.

Some of the recent studies on supply response in India have shown that the elasticity of aggregate agricultural output with respect to the agricultural terms of trade is positive and statistically significant (Palanivel, 1995; Misra, 1998). The short-run elasticity ranges from 0.05 to 0.19 while the long-run elasticity ranges from 0.09 to as high as 0.79 . Palanivel (1995) concludes that 'though changes in price incentives are an important factor to raise agricultural output, non-price factors such as status of infrastructure, irrigation and credit and public expenditures in agriculture, are more important than relative prices in inducing higher agricultural output'. The short- run elasticity is very low and long-run elasticity is considered questionable and should not be used for policy analysis (see Binswanger, 1989).

Engel's Law and Changing Food Consumption Pattern

Engel's law, which is really an observed empirical regularity, states that the proportion of total expenditure spent on food falls with rising incomes. This can be verified for specific households across time by holding prices constant, or can be tested in cross-section data across various income classes. But in the Indian context, the Engel curve is quite flat at low expenditure levels, so much so that for the bottom four deciles of the consumption data, food share is a constant at around 78 per cent. (see Ravallion, 1998). This feature has been observed for various rounds of the NSS and has invited comment and study. Since the typical consumption baskets of the poor are different from the non-poor, it is important to look at the changing pattern in food consumption. But as an illustration of the impact on measured inequality, we show in Table 3.5 the difference in Gini coefficient when real consumption expenditures of the bottom four deciles are deflated by the relative prices of food. Since food prices have risen faster than the overall consumer price level (CPIAL), this corrected Gini shows greater inequality than the unadjusted Gini.

The consumption pattern has been shifting over time from (i) coarse cereals to fine cereals and (ii) from cereals to non-cereals like milk and eggs (see Tables 3.6 and 3.7). The per capita quantity consumption of coarse cereals has declined. Whether this effect is mainly supply driven or demand driven is debatable. The share of coarse cereals in total cereals has declined drastically in recent years even for the bottom 30 per cent of population (Tables 3.6 and 3.7). The changes in consumption pattern away from coarse cereals have strong regional implications. Coarse cereal production and consumption is concentrated in six states (Maharashtra, Rajasthan, Madhya Pradesh, Andhra Pradesh, Karnataka, and Gujarat).

TABLE 3.5

Adjusted and Unadjusted Gini Coefficients

		Urban Gini (per cent)			Rural Gini (per cent)		
NSS Round	Years	Unadjusted Gini	RPF*	Adjusted Gini	Unadjusted Gini	RPF*	Adjusted Gini
32nd	1977–8	34.04	1.052	36.83	33.50	1.080	34.79
38th	1983	31.95	1.06	33.08	29.00	1.096	31.00
42nd	1986–7	33.60	1.041	34.43	—	—	—
43rd	1987–8	36.20	1.041	36.93	29.82	1.086	31.61
44th	1988–9	33.42	1.087	35.10	28.76	1.09	30.76
45th	1989–90	33.16	1.091	34.08	26.37	1.082	28.13
46th	1990–1	—	1.112	—	27.66	1.084	29.42
47th	1991	35.52	1.125	37.50	28.72	1.09	30.82
50th	1993–4	—	1.131	—	29.98	1.091	31.80

Notes: * Relative Price of Food, base 1960–1 = 100, Gini estimates based on NSS data.

The implications for poverty, of shifts in consumption patterns away from coarse cereals to fine cereals and from cereals to non-cereals, are the following:

The poverty line is computed based on a fixed basket of 1973–4 which satisfied the minimum calorie requirement of 2400 calories. Hence all the poverty estimates since the early 1970s are critically linked with that of the base year (1973–4). The poverty line for rural areas in 1973–4 was Rs 49 per person per month. The estimation of poverty in 1993–4 is based on the consumption basket of 1973–4 evaluated at 1993–4 prices. The updated rural poverty line for 1993–4 was Rs 206, which implied an HCR of 37.3 per cent.

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[12] A decline in non-farm employment and a rise in on-farm employment during the post reform years has been observed by many researchers, including Sen (1996) and Chandrasekhar and Sen (1996). Ravallion's (1990) study of Bangladesh also shows that real wages can substantially lag behind increases in output prices.

TABLE 3.6

Percentage Distribution of Monthly Per Capita Consumer Expenditure (MPCE) by Item over NSS Rounds

Rural India

	1972–3	1977–8	1983	1987–8	1993–4
Rice & wheat products					
Coarse cereals	10.8	6.7	5.7	3.2	2.3
Total cereals	40.6	32.8	32.3	26.1	24.2
Gram	0.6	0.4	0.3	0.2	0.2
Cereal substitute	0.5	0.3	0.2	0.1	0.1
Pulses & pulse products	4.3	3.8	3.5	4	3.8
Milk & milk products	7.3	7.7	7.5	8.6	9.5
Edible oil	3.5	3.6	4	5.6	4.4
Meat, egg, and fish	2.5	2.7	3	3.2	3.3
Vegetables	3.6	3.8	4.7	5.2	6
Fruits & nuts	1	1.1	1.4	1.6	1.4
Food total	72.8	64.3	65.6	63.8	63.2
	(82.2)*	(78.3)*	(75.8)*	(72.4)*	(72.4)*
Non-food total	27.2	35.7	34.4	36.2	36.8
Total	100	100	100	100	100
Total MPCE (Rs)	44.2	68.9	112.5	158.1	281.4
MPCE index (1972–3 = 100)	100	156	255	358	637
Consumer price index	100	144	227	289	520

Note: *Refers to the share of food expenditure in total expenditure for the bottom 30 per cent of population.

Source: NSSO (1996) and Dubey and Gangopadhyay (1998).

This estimate of rural poverty assumes that the consumption basket of the base year does not change, and the HCR correctly identifies the calorie deficient group. But in fact, since the consumption basket has been changing, the calorie deficient group is larger than the HCR defined poor. The report of the Expert Group on Poverty (GOI, 1993) indicated that around 66.6 per cent of the rural population was below calorie norm in 1983, while the usual head count ratio was 45 per cent in the same year (see Table 3.8). The gap between the poor as defined by the Expert Group poverty line and the number of persons below the calorie norm has been widening in the last ten years. By 1993–4, the gap was almost 32 per cent , since almost 70 per cent of rural population was below the calorie norm in 1993–4. Hence the updated poverty line for 1993–4, which ignores changes in the consumption basket, might be an incorrect description of adequate purchasing power that buys 2400 kcals.

TABLE 3.7

Percentage Distribution of Monthly Per Capita Consumer Expenditure (MPCE) by Item over NSS Rounds

Urban India

	1972–3	1977–8	1983	1987–8	1993–4
Rice & wheat products					
Coarse cereals	2.7	1.7	1.3	0.8	0.5
Total cereals	23.3	20.4	19.5	14.8	14.0
Gram	0.3	0.2	0.2	0.2	0.2
Cereal substitute	0.1	0.1	0.1	0.1	0.1
Pulses & pulse products	3.4	3.6	3.2	3.4	3.0
Milk & milk products	9.3	9.5	9.2	9.5	9.8
Edible oil	4.8	4.6	4.8	5.3	4.4
Meat, egg, and fish	3.3	3.5	3.6	3.5	3.4
Vegetables	4.4	4.4	5.0	5.2	5.5
Fruits & nuts	2.0	2.0	2.1	2.5	2.2
Food total	64.5	60.0	59.1	55.9	54.7
	(78.1)*	(74.5)*	(72.1)*	(69.9)*	(69.9)*
Non-food total	35.5	40.0	40.9	44.1	45.3
Total	100	100	100	100	100
Total MPCE (Rs)	63.3	96.2	164.0	249.9	458.0
MPCE index (1972–3 = 100)	100	152	259	395	723
Consumer price index	100	160	258	364	618

Note: *Refers to the share of food expenditure in total expenditure for the bottom 30 per cent of population.

Source: NSSO (1996) and Dubey and Gangopadhyay (1998).

TABLE 3.8

Persons in Rural Areas below Poverty Line and below Calorie Norm

(per cent)

	1983	1987–8	1993–4
Below official povery line	45.7	39.1	37.3
Below the calorie norm (2400 kcal)	66.6	65.8	70*
Gap between the two norms	20.9	26.7	32.7

Note: * Personal communication from Planning Commission.

Source: GOI (1993) and Draft Ninth Five Year Plan.

In fact the true cost of adequate calories in 1993–4 is not Rs 206 (the rural poverty line) but Rs 320. This increase in cost of calories has adverse implications for the poor.

The Report of the Expert Group also says, 'Where these shifts in consumption pattern are predominant, the cost of requisite calories is becoming higher. There is thus, a decline in the average intake of calories across expenditure classes even though, the real per capita expenditure has been rising.' For example, monthly per capita calorie intake for the bottom 30 per cent has declined from 1664 in 1977–8 to 1599 in 1983 (GOI, 1993).[13]

POVERTY ALLEVIATION PROGRAMMES: ISSUES AND EXPERIENCES

Economic growth creates more resources and has the potential of creating opportunities in the form of productive employment for the poor. It is, however, recognized that along with growth promoting policies, direct poverty alleviation programmes are also needed to raise the incomes and purchasing power of the poor, particularly in the short and medium runs. Economic reforms comprising structural adjustment and macro-economic stabilization measures introduced in several countries and the recent economic crisis in the countries of East and South East Asia have given rise to renewed interest in targeted poverty alleviation programmes.

The programmes which are aimed at directly helping the poor instead of the entire population are termed as targeted poverty alleviation programmes. The main objective of these programmes is to directly help the poor improve their economic, physical (nutrition, health), and social conditions. Note that these are programmes that directly target the poor and the benefits from them would be in addition to those that would accrue to the poor from normal economic activities. These schemes are supposed to protect a person or household in the case of both chronic as well as transient poverty.

The Issue of Targeting

Targeting is regarded as an attractive way of intervention for poverty alleviation in many developing countries which face the necessity both of reducing the poor and of limiting public spending. The rationale for targeting is that the benefits or social returns are higher for the population at the lower end of income distribution than at the upper end.

Identifying the poor is important for the success of targeted poverty alleviation programmes. The approaches to identify the poor can be grouped under three broad categories: means-testing or income criterion, indicator targeting, and self-targeting. Information on income or consumption is generally used as a means test that ascertains whether household income is below the cutoff point. If it is possible to conduct a perfect means test, targeting by income scores over other types. But because of informational and administrative constraints, means testing may not be perfect and may induce costly leakages and create adverse incentives. These considerations have led to a variety of schemes for indicator targeting, whereby transfers are made contingent on some correlates of poverty. Indicator targeting can in turn be divided into two types. The first one is similar to means testing and uses some characteristics of households to select beneficiaries. Under this category, instead of information on income or consumption, information on variables like landholding, profession, or social class is used for targeting. The second type of indicator targeting known as geographical targeting uses the place of residence as a poverty indicator. Geographical targeting allocates resources to states, municipalities, or neighbourhoods based on their average welfare level (e.g. head count ratio). An example of innovative ways to identify the poor (through proxy variables) is provided in Box 1, taken from Rao, Naidu, and Raju (1998).

Finally, self-targeting is generally suggested for poverty alleviation because of its simplicity in administering the programme. Self-targeting occurs where a programme is ostensibly available to all but is designed to discourage the non-poor from participating. For example, participants can be required to do manual work, as in public employment programmes. It acts as an effective deterrent to higher income groups.

Three Major Programmes: Employment, Credit, and Food

The existing major programmes for the poor in India can be broadly divided into the following three categories: (a) wage employment programmes (e.g. public works); (b) credit-based self-employment programmes (e.g. IRDP); and (c) the public distribution system (PDS) and nutrition programmes (e.g. Integrated Child Development Services [ICDS]).

Wage Employment is Better Targeted

It has been shown that in terms of targeting success, self- targeting schemes like rural public works score over income-based targeting (Ravallion and Datt, 1995). For example, a comparison of public works programmes and the IRDP (self-employed programme) in Maharashtra shows that participation in public works is highest for the poorest households and tapers of with rising expenditure levels (see Figure 3.1). But the IRDP data reveal participation is more or less similar across expenditure classes (a horizontal straight line). In other words, participation in the IRDP has no relationship

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[13] On the question of whether 2400 calories are indeed required for the poor and related issues, see Rath (1996).

Box 1
How to Identify the Poor?

The approach described here, taken from Rao, Naidu, and Raju (1998), is based on categorizing the poor according to different characteristics.

	Characteristic	*Remark*
1.	Size group of cultivated holding	Indicates access to land
2.	Type of house	
3.	Ownership of consumer durables (radio, TV, refrigerator, fan, telephone, mixer, kitchen equipment, two-wheeler, car, almirah)	Indicators sensitive to upward mobility of rural households
4.	Literacy status of the highest literate adult male in the household	Indicators reflecting access to information, development agencies, outside world, and readiness to adapt to the changing world
5.	Literacy status of the highest literate adult female in the household	
6.	Status of children	Whether children work or go to school would be a revealing clue to the economic status of the household
7.	Occupation of the household/highest earning member in the household	Indicators sensitive to economic status
8.	Type of indebtedness	
9.	Development assistance received during the last five years	Indicators reflecting access to development agencies
10.	Minimum monthly income expected by unemployed youth in the household	Gives an indication of reserve price of labour and, indirectly, of the economic status of the household

A study on anti-poverty programmes suggests the following procedure for constructing an overall index based on the array of characteristics given above. The steps involved here are as follows:

- A scoring scheme is devised by which a household gets an integral score from 0 to 5 for each characteristic applicable to the household depending on its status with respect to that characteristic. For example, the scores for 'size group of cultivated holding' are as:

Household having	Score
No cultivation	0
Marginal holding	1
Small holding	2
Medium holding	3
Large holding	5

As the last size group is open-ended, a higher score of 5, instead of 4, is given. The same logic is also followed for other characteristics.

- Obtain the total score of the household by adding the scores of characteristics applicable to the household. Similarly, obtain the maximum total score for the household by adding the maximum scores for the characteristics applicable to the household. For example, for a household without children characteristic no. 6 would not apply and, hence, the maximum total score of the household would be 45 and not 50. Further, no score should be assigned to this household for characteristic no. 6.

- The percentage of total score of a household to its maximum total score is used as an overall index for categorizing the poor as shown alongside.

Overall index	Score
Less than 20 per cent	very poor
20 per cent to 40 per cent	poor
40 per cent to 60 per cent	not-so-poor
60 per cent and above	rich

The above scheme has to be tested at field level in different places.* This type of procedure would be beneficial for a decentralized planner in improving the targeting aspect of targeted poverty alleviation programmes.

Source: Rao, Naidu, and Raju (1998)

Note: *Rao, Naidu, and Raju (1998) did a pilot study in some villages of Andhra Pradesh and Karnataka. They found this procedure to be satisfactory.

with expenditures. These data suggest that public works are much better targeted and that income-based means testing such as followed by the IRDP does not ensure better targeting. However, the data used by Ravallion and Datt refer to 1987–8. The recent data for the year 1993–4 indicate that even in the IRDP, the percentage of participating households is higher for some of the lower expenditure classes as compared to upper expenditure classes (see Figure 3.1). It shows there has been some change in targeting over time for the IRDP.

In recent years, comparisons have been made between the Employment Guarantee Scheme (EGS) and the PDS as shown in Table 3.9. Table 3.9 shows that although transfer efficiency is higher under the PDS than in the EGS, the benefit–cost ratio in the PDS may be only half that in the employment programmes. This is because of better targeting in employment programmes. However, the coverage is much wider for the PDS (for more on this see Dev, 1996).

Cornia and Stewart (1995) divide the errors of targeting government expenditures on poor people into two: 'E' mistakes (excessive coverage) in which benefits are provided to the non-poor as well as the poor, and 'F' mistakes (failure to reach target) in which some of the poor fall outside the scope of the programme. In employment programmes which are generally self-targeted, the 'E' mistakes would be lower than 'F' mistakes. In untargeted programmes like the PDS, the 'E' mistakes (coverage of non-poor) are expected to be larger than in targeted programmes.

TABLE 3.9

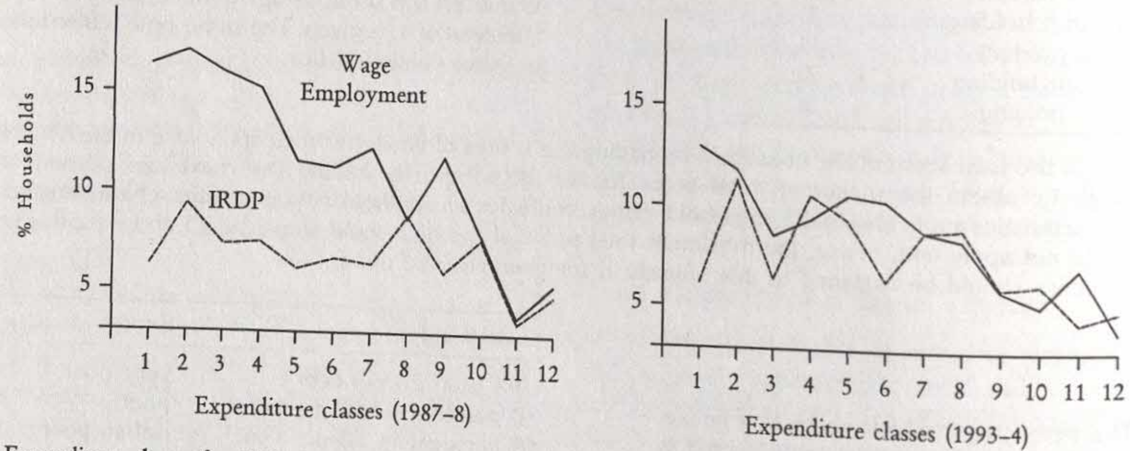
Comparison of Cost-effectiveness in the EGS and PDS in India

	EGS	PDS
1. Budgetary cost	100[a]	100[b]
2. Overheads	50[c]	37[d]
3. Leakage	10[e]	35[f]
4. Gross benefit (1–2–3)	40	28
5. Participation cost	16[g]	neg[h]
6. Net benefit (4–5), i.e. transfer efficiency	24	28
7. Targeting efficiency (coverage of poor)	0.9	0.4
8. Final transfer to poor (6*7) (benefit–cost ratio)	21.6	11.2

Notes: [a] Aggregate cost for creating one person-day of employment.
[b] Cost of food subsidy.
[c] Administrative overheads and non-labour expenditures.
[d] Distribution overheads such as freight, storage, costs, and interest being 57 per cent of 65 per cent reaching consumers.
[e] Underpayment of wages.
[f] In transit and at point of sale.
[g] Foregone earnings.
[h] Negligible, assuming that forgone earnings due to waiting time and transport costs to retail shops are not significant.

Source: Adopted from Guhan (1994).

In the case of employment programmes, 'E' mistakes are expected to be less and 'F' mistakes are expected to be higher as compared to the PDS. For example, 90 per cent of workers working under the EGS were poor according to some estimates (Dandekar, 1983). In this case, 'E' mistakes are very low. However, 'F' mistakes are high under employment programmes because many of the poor are generally not covered. Another point is



Expenditure classes for 1987–8 are as follows:

1 < Rs 65
2 65–80
3 80–95
4 95–110
5 110–25
6 125–40
7 140–60
8 160–80
9 180–215
10 215–80
11 280–325
12 > Rs 385

Expenditure classes for 1993–4 are as follows:

1 < Rs 120
2 120–40
3 140–60
4 160–90
5 100–210
6 210–35
7 235–65
8 265–300
9 300–55
10 355–445
11 445–560
12 > Rs 560

Figure 3.1 Participation of Households in Wage Employment and Credit (IRDP) Programmes (by expenditure classes) 1987–8, 1993–4.

that the EGS is considered superior to the PDS even if it does not create any assets (see Parikh, 1993). The EGS scores much more over other poverty alleviation programmes if secondary benefits such as asset creation, increase in agricultural wages, and insurance benefits are considered. If these benefits are considered, the impact of the EGS on the poor could be much higher than that of the PDS.

Regarding credit-based self-employment programmes, group lending is more successful in targeting than lending for individuals.[14] In general, government run programmes are less successful in targeting as compared to NGO-based community participated programmes. For example, the Self Employed Women's Association (SEWA) has excellent targeting record. Targeting based on age, gender, and other vulnerabilities is also successful in identifying the targeted groups (e.g. nutrition programmes, programmes for children and women, programmes for the elderly, widows, and the handicapped). Decentralized programmes (e.g. involvement of panchayats) are also more successful in targeting than centralized programmes. Maternal and child nutrition programmes appear to be better targeted than most other programmes, presumably because targeting women and children requires less administrative effort.

Economic and Social Impact and Empowerment of Women

Public works programmes have direct benefits in the form of employment and income to the poor. Some recent estimates show that a Jawahar Rojgar Yojana (JRY) worker earned on average 40 per cent of the poverty line threshold and thus the JRY seems to be contributing substantial income to the families working under the scheme (see Dev, 1998). Public works programmes have many other direct and indirect benefits. Public works stabilize the income and act like an employment insurance for the poor. The other benefits are asset creation and impact on agricultural growth; upward pressure on agricultural wages; impact on women; and collective political action. Public works programmes also helped in preventing famine during the drought of 1970–3 in Maharashtra in spite of the low and declining per capita availability of foodgrains in the state.

It has, however, been argued that if you depend more on wage employment programmes, skills cannot be improved for the poor. Self-employment programmes on the other hand can increase the skills of workers. Also, in future, skill-based workers will get much higher wages and wage-employed people continue to get lower wages particularly in the post-economic reform period. If the self-employed programmes are successful, they are better in terms of income sustainability than public works programmes. However, the Indian experience of the IRDP is not satisfactory. On the other hand, NGO-based programmes like SEWA are more successful (in terms of use of credit, repayment, and empowerment of women), although their scale of operation is not large.

The empowerment of women is one of the dual objectives of many self-employment credit-based programmes. Some attempts have been made in Bangladesh (see Box 2) to quantify the empowerment of women in the form of indices, viz. interspouse consultation index, autonomy index, and authority index (see Amin, Becker, and Bayes, 1998). They can be applied to Indian data to examine the empowerment of women in self-employment programmes.

In terms of impact on women and children, nutrition programmes which have both short- and long-term benefits are very important. The Tamil Nadu Integrated Nutrition Project (TINP) is a successful example in India. With the help of credit from the International Development Authority, the World Bank's concessionary lending agency, the TINP started in 1981 in a few districts of Tamil Nadu as a nutrition and health programme. This project aims at improving the health status of pre-school children as well as of pregnant and nursing mothers. Implementation of the nutrition component of the programme in a village is the responsibility of a locally recruited village-based community nutrition worker and a helper. Monitoring and supervision of the community nutrition workers are the responsibility of the community nutrition supervisor. The health component of the programme, however, is implemented by health workers who are chosen from outside the community and provide back-up health services and preventive care. Some evaluations show impressive success for the TINP (see Balachander, 1993; Subbarao, 1992). Severe malnutrition was reduced by 25–55 per cent in various blocks (clusters of villages), the percentage varying directly with the duration of the project. Additionally, there was a reduction in the incidence of moderate malnutrition. Evaluations also found that the nutrition benefits received from the project tended to be long lasting. In its second incarnation as TINP II, the project extended its services to include young children. It now covers most of rural Tamil Nadu. Thus the scale of operation of the TINP is large. TINP II began in 1991 and combined the best features of TINP I and other programmes such as the

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[14] The Ninth Five Year Plan of India emphasizes group lending in the case of the IRDP. See World Bank (1998) for information problems associated with credit programmes.

Box 2

Indicators of Empowerment Index for Women

Interspouse Consultation Index	*Autonomy Index*	*Authority Index*
Frequency of respondent being consulted by her husband on the following matters	Frequency of husband's restrictions on the following matters	
Buying household furniture	Visiting respondent's parental home	Voting in election
Purchase of land	Visiting hospital	Child's education in school
Education expenses of children	Visiting village market	Family planning
Medical treatment of family	Helping a relative with money	Family day-to-day expenditures
Purchasing women's clothes	Setting aside money for respondent's own use	
Purchasing daily food		Medical Treatment, Entertaining Guests

Source: Compiled from Amin, Becker, and Bayes (1998).

ICDS. A key change was the addition of pre-school education to the programme. The chief contribution of the TINP has been that it has demonstrated that a limited package of health linked nutrition interventions is operationally feasible in rural India in a cost-effective manner through the medium of local village-based para-professionals and that it could have substantial impact on the health status of children of vulnerable groups (see Box 3).

Financial Viability of the Anti-poverty Programmes

Government budgets are shrinking partly due to stabilization and structural adjustment measures. As a result, there has been greater emphasis on cost effectiveness and self-sufficiency of funds. Programmes which require large budgetary support cannot be sustained for long. Even if they are sustained, the opportunity costs of those funds could be quite high. NGO credit programmes like SEWA have the feature of sustainability because of financial viability.

There are two issues in financial viability: cost effectiveness and self-sufficiency of funds.

Cost Effectiveness

Cost per One Rupee Transfer to the Poor: A comparison of some anti-poverty programmes in India (see Radhakrishna et al., 1997) shows that employment programmes fare better than food transfer programmes in terms of cost effectiveness, though the ICDS appears to transfer income to the poor at lower cost (Table 3.10). The PDS and Andhra's rice subsidy emerge as very expensive. Employment programmes are better largely because of the potential for self-targeting in these

Box 3

The Tamil Nadu Integrated Nutrition Programme—TINP II

(a) *Facilities improvement:* 874 new community centres (CNCs) established; 6400 existing CNCs strengthened; 29 new CNCs constructed.

(b) *Health Workers Trained:* 276 block training teams and 300 block project officers to serve as trainers; 15,103 community nutrition workers (CNWs); 4292 helpers; 2051 CN supervisors; 496 medical officers; 176 CN instructors; and 80 birth attendants trained.

(c) *Beneficiary involvement:* Groups of women beneficiaries (100 groups, meeting 9 or more times per year) organized to help CNWs overcome resistance to the project, increase participation in project activities, publicize programme, and provide material and moral support to the CNWs. Community mobilization and training of community groups undertaken (target of 40 persons per village in 6400 villages partially achieved).

(d) *Outcomes:* As of August 1994, severe malnutrition (grades III and IV) had been reduced from 4 per cent in the 1980s to 2 per cent and moderate malnutrition (grade II) from 28 per cent to 15 per cent. In the project's new expansion areas, between March and August 1993, malnutrition in grades III and IV was reduced from 7 per cent to 2 per cent and in grade II from 29 per cent to 20 per cent.

Source: Carvalho and White (1966)

schemes. The ICDS is the least expensive in terms of cost per rupee of income transferred suggesting that self-targeting is highest in this scheme. However it cannot reach all poor households.

TABLE 3.10

Cost per One Rupee of Income Transferred by Various Programmes

Schemes	(in Rs)
PDS	5.37
Andhra rice scheme	6.35
JRY	2.28
Maharashtra EGS	1.85
ICDS	1.80

Source: Radhakrishna et al. (1997) for PDS, Andhra rice scheme, and ICDS, Dev (1998) for JRY and EGS.

In the case of credit programmes low interest rate is not the solution. Low interest loans may entail a number of hidden transaction costs to borrowers, so that they may not be as inexpensive as they appear. These costs include transportation expenses, opportunity costs of lengthy processing time, and bribes to lending officials. They may explain why the poor sometimes do not avail of subsidized credit, even if they do have access to it. Because of the large subsidies, the government credit programmes are not cost effective. In general, subsidy driven programmes impose a fiscal drain on the economy and they are not financially viable. Government or donor supported schemes are not financially sustainable. India's IRDP has low financial viability from the point of view of funds mobilized under the programme and loan repayment. The sustainability of the programme depends on several factors such as positive interest rates, high repayment rates, low administrative costs, and encouragement of savings (see Yaron, 1992). Only few large-scale programmes like the BKK (Badan Kredit Kecamatin) of Indonesia and the Grameen Bank of Bangladesh are successful in realizing these goals. The other programmes which are successful are extremely small in reach. For example, in India, MYRADA which serves 0.5 million people is more successful than the nationwide IRDP which serves 135 million people. However, NGO-based programmes alone cannot alleviate poverty. For example, despite the presence of the Grameen Bank for almost twenty years, poverty in Bangladesh is relatively high. Successful self-employment programmes should have the following characteristics (see Subbarao et al., 1997): (a) organizing beneficiaries into groups and incorporating incentives for both borrowers and lenders in the case of repayment; (b) encouraging savings behaviour among the beneficiaries; (c) avoiding targeting based on means tests—designing programmes to promote self-selection; (d) reducing transaction costs (e.g. many trips to to the credit office, complex procedures for repayment); (e) not subsidizing interest rates.

Self-sufficiency of Funds

With regard to recovering funds from the programmes, NGO-based programmes with community participation are much better than government credit-based programmes. The experiences of the Grameen Bank and SEWA show that the repayment rates for loans are quite high. Some of the NGO programmes even have health insurance schemes for the poor.

It may be noted, however, that in the case of public works and health and education programmes, it is difficult to recover the costs and the government may have to bear the major responsibility.[15] Some of these programmes, particularly on education, may have more long-term benefits. The production of human capital takes time. Even when the infrastructure and key inputs exist, primary education usually takes four to five years of classroom instruction. The benefits of education (e.g. higher wages and a more efficient allocation of resources in farming), are likely to materialize after the completion of the course. Given the lags in the production of human capital, there are no immediate benefits to the poor. The short-term effects of education for a poor family can be negative. For example, a family may lose income if a child labourer joins a school. The long-term benefits of education are, however, well known. Health programmes are of course beneficial for both short and long terms. Because of the long-term benefits of education and health programmes, they should not be compared with short-term self- and wage employment programmes.

Decentralization and People's Participation

There has been a lot of emphasis on decentralization of governance and people's participation in India. These are important for financial sustainability of anti-poverty programmes. Decentralizing governance from capital cities to towns and villages can be one of the best means of promoting participation and efficiency. Local officials and politicians can be much more open to public scrutiny than national governments—and more accountable to the communities and individuals they are supposed to serve. The financial sustainability of the programmes in turn also improves peoples' participation. They feel that they are not dependent on doles or charities.

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[15] Health insurance can have some self-financing features.

PROGNOSIS FOR GROWTH IN AGRICULTURE

Poverty alleviation strategies in terms of interventions in labour and credit markets work in the short to medium run. But the long-term poverty reduction or eradication strategy must involve policies that enhance economic growth and productivity. As has been mentioned earlier, since a large number of the poor are in the agricultural sector, greater emphasis must be placed on ensuring healthy growth in agriculture. However, as we argue below, the incentives for growth cannot be solely 'price' driven but must involve non-price factors such as infrastructure, institutions, and technology.

The pre-reform regime has been characterized as biased against agriculture with heavy protection to industrial goods, an overvalued exchange rate, and rigid controls on export, movement and prices (through levies) of agricultural goods. The structural adjustment that followed in the wake of economic reforms concentrated on industrial delicensing and liberalizing the foreign exchange regime, and resultantly ensured a somewhat 'level playing field' for agriculture. This improved the terms of trade in favour of agriculture from 81 per cent to almost 99 per cent in terms of the 1970–1 levels.

The Importance of Non-price Factors

These increasingly favourable terms of trade for agriculture are supposed to attract private investment into agriculture, thereby leading to growth in output and demand for rural labour. There is strong evidence of growth in private sector investment in agriculture especially since the late 1980s . Whether this increase in private investment alone can lead to sustained growth in agriculture remains to be seen. This is especially so in light of the complementarity between public and private investment, as manifested by the state of rural infrastructure, public irrigation, roads, and power. Thus even though the terms of trade are becoming favourable, and that the 'prices are right', unless the non-price factors also become favourable, it may be too early to see the impact on growth.

Almost three decades ago, Dantwala (1967) examined incentives and disincentives in Indian agriculture and concluded that price policy played only a limited role in raising aggregate agricultural output. What was needed was improvements in non-price factors such as technology and infrastructure including irrigation. Aggregate supply elasticity is notoriously low in agriculture, especially in the short run, and prices alone cannot spur growth immediately . Some crops will respond quickly but aggregate response will be extremely sluggish. As Binswanger (1989) says, the supply response to prices takes time to develop fully, sometimes as many as ten to twenty years, and depends on public investment in roads, markets, irrigation, infrastructure, education, and health.

In a survey on aggregate agricultural supply response in developing countries, Schiff and Montenegro (1997) argue that prices and non-price factors are complements rather than substitutes. In other words, a higher level of irrigation and other public investment created infrastructure raises the impact of prices on output, and vice versa higher agricultural prices raise the impact that public investments have on output. McGuirk and Mundlak (1991) also come to similar conclusions in their study on Indian Punjab. According to them:

> As long as expansions in irrigation facilities and fertilizers are possible and lead to further adoption of the productive techniques, aggregate agricultural output will continue to respond significantly to changes in economic incentives. However, once the transition to the new varieties is fully played out, stagnation will occur. Once stagnation occurs, further substantial growth in agricultural output will require the introduction of new higher-valued techniques and products.

The Indian evidence clearly shows that the growth of foodgrains production in the post-reform period has been lower than in earlier periods despite successive good monsoons for the last ten years (see Table 3.11). It is true that the area under coarse cereals and pulses has been shifted to oilseeds. But the yields of rice and wheat have been more or less stagnant.

TABLE 3.11
Annual Compound Growth in Foodgrains Production

(percentages)

Period	Rice	Wheat	Pulses	Foodgrains
1967–8 to 1997–8	2.85	4.60	0.91	2.60
1980–1 to 1997–8	3.08	3.58	1.06	2.60
1990–1 to 1997–8	1.60	3.72	0.34	1.73

Source: Economic Survey 1997–8, Government of India.

The compound growth rate of the all crops index in the post reform period (1991–2 to 1995–6) was 1.71 per cent per annum which is much lower than pre-reform period growth rates (Misra, 1998) . Thus despite improvements in the terms of trade for agriculture, the performance of agriculture has been poor in the post reform period. It shows that non-price factors are more important for stepping up growth.

Nevertheless, as shown by some of the above mentioned and other studies, it is better to view the price and non-price factors as complements.

OTHER ASPECTS OF SOCIAL INSECURITY

We have already discussed income insecurity in the form of poverty. Here we examine social and income security for selected vulnerable groups such as the elderly, widows, and child labourers.

The Elderly

Since a further breakthrough in fertility and mortality is expected, the proportion of the elderly in India is likely to rise in the coming years. The old age population (age 60+) has increased from about 19.8 million in 1951 to 56.7 million in 1991 and its share in the total population has risen from 5.5 to 6.8 per cent during the same period. According to the population projections prepared for the Ninth Plan, the number of those aged 60 and above will rise from 54.5 million in 1991 to 70.6 million in 2001 and 113 million in 2016. The share of the aged in total population is likely to increase to 8.9 per cent by 2016. Some characteristics of the old age population are given below (see Visaria, 1998 for further details).

(a) The percentage of the old age population in rural areas (7.1 per cent) was higher than that for urban areas (5.7 per cent) in 1991.

(b) The proportion of the elderly was almost the same for both males and females (6.7 per cent) in 1991 and is likely to increase faster for females in future.

(c) The proportion of illiteracy among the old age population is much higher than in the population aged 15 and over (see Table 3.12).

(d) The proportion of workers among the aged is higher than among population aged 15 and above. A majority of the workers among the elderly are self-employed (75 per cent for rural and 71 per cent for urban areas). Casual work is the second most important work category for the aged.

(e) The special survey of the NSS for 1995–6 on the aged shows that about 30 and 31 per cent of the elderly males in rural and urban areas were fully dependent on others. The corresponding figures for females in rural and urban areas were 71 and 76 per cent.

TABLE 3.12

Percentage of Illiteracy among the Aged and among those in the Age Group 15 years and above, All India 1993–4

	60+ Rural	60+ Urban	15+ Rural	15+ Urban
Male	65.1	28.4	41.1	16.2
Female	92.1	66.7	70.8	36.3
Total	78.4	48.2	55.8	25.7

Source: Compiled from Visaria (1998).

According to James (1994):

> The various small sample surveys conducted in rural India in general reflects [sic] a greater degree of financial insecurity among the aged, and this insecurity is more pronounced in the case of females compared to males. Moreover, financial problems are more common among widows and among elderly in nuclear families. The worries of the elderly are on two fronts, one in relation to social strain and the other on economic independence. The worries on social relation aspect are much more complex compared to economic worries for those who live in nuclear families or living alone [p. 2336].

The majority of the elderly also seem to be suffering from ill-health and poverty.

There is need for a comprehensive policy for taking care of the problems of the elderly. Informal methods for obtaining income security, such as India's joint family, are increasingly unable to cope with the enhanced life spans and enhanced medical costs in old age. Hence there is acute need for formal arrangements which can supplement informal systems. The programmes for old age can be in two forms: pension funds and health insurance.

Social Insurance for the Elderly

Social security for the elderly or, more appropriately, social insurance against poverty (income security) and ill health (health security) can be seen as a contractual arrangement that the elderly sign with the government, which in turn finances it by taxing the working young. The contract is 'paid for' by the elderly during their working lives, and they expect it to be honoured when they are old. This is why social insurance provision needs government intervention, since a private provider runs a risk of bankruptcy and cannot guarantee that the contract will be honoured. Such programmes of complete government coverage have run into serious fiscal sustainability problems in many developed economies, largely due to falling dependency ratios combined with generous benefits.

PENSION SCHEMES: At present, less than 10 per cent of workers between the ages 20 and 59 (i.e workers in the organized sector) are prepared for income security in old age using the existing formal systems. Almost all states and union territories have old age pension schemes. A few states such as Andhra Pradesh, Gujarat, Kerala, and Tamil Nadu also have special pension schemes for agricultural labour. However, working of pension schemes for the unorganized sector is not satisfactory except in states like Kerala. The National Social Assistance Programme (NSAP) was launched by the central government in August 1995. Old age pension to the poor of age 65 or above at Rs 75 per month is one of the components of the NSAP. This is not enough to achieve income security for the elderly. There is a need for framing a comprehensive pension scheme covering the unorganized workers.

HEALTH INSURANCE: Any provision of health insurance to the elderly will necessarily involve government because of market failure. There is almost none or very little provision of health insurance to the elderly in India. Based on the surveys of the NSSO, NCAER, and the National Family Health Survey it has been noted that the elderly suffer from severe physical and mental problems. Furthermore, increasing diagnostic and drug prices have contributed to their vulnerability. There is also a growing disease burden among the elderly. There are basically three market products for health insurance that the elderly can access in the Indian market. They are: Mediclaim, Senior Citizens Unit Plan, and Bhavishya Arogya Yojana. Mediclaim statistics show that the total number of people covered is a modest 1.3 million, of which the elderly probably constitute a small fraction. We can thus see that total coverage for health services for the elderly is miniscule, in that only a tiny fraction of the nation's 54 million elderly have assured medical services. Therefore, there is need for designing a comprehensive health insurance scheme for the elderly with the support of the government.

Widows

There are about 33 million widows in India in 1991 and the condition of widows is one of the most neglected social issues in the country. The quality of life is lowered for many Indian women because of widowhood. Only 3 per cent of all Indian men are widowed, compared with 8 per cent of women. This large gap primarily reflects a high incidence of remarriage among widowers. In many places, widows cannot participate in some of the social functions. According to some estimates, mortality rates are, on average, 86 per cent higher among elderly widows than among married women of the same age. The disadvantages and insecurity experienced by many Indian widows are brought out in a study of north Indian villages (see Chen and Drèze, 1992; Drèze and Sen, 1995). These are given below.

(a) The legal rights of widows are violated and a large majority of widows have very limited and insecure property rights. Widows lose not only a potential source of independent income but also bargaining power with in-laws, sons, and other supporters.

(b) Widows are expected to stay in the husband's village and face social isolation.

(c) They have limited freedom to remarry.

(d) The segmentation of the labour market by gender severely restricts employment opportunities for widows. Also, they tend to be concentrated in the older age groups and their labour force participation rate is lower than that for married women.

(e) Most widows get little economic support from their family or at community level. There is no evidence of joint family providing support to widows. The majority of them live on their own with unmarried children or stay with adult sons as dependants.

How do we provide income and social security for widows? Some of the above factors can be seen as an integral part of the gender inequalities in India. One way is to provide property rights, particularly land rights, for women. So far, the strategy of land reforms has not given importance to the existing gender inequalities in land inheritance laws and ceiling laws. Women are more dependent on agriculture for a livelihood than men, as men shift to non-farm employment. It is estimated that 20 per cent of rural households are de facto female headed. Yet very few women have titles to land and even fewer control it. Therefore, ensuring women's effective command over land in the form of land rights will be one of the measures needed for providing income security for widows.

Widow Pensions

Many states have widow pension schemes on paper but, except in states like Kerala, they have negligible coverage and impact. A study on destitute widows in Dindigul district of Tamil Nadu provides some evidence on the accessibility of the scheme. Based on a survey of widows in Dindigul district, this study focuses on (i) how accessible the scheme is to needy destitute widows and (ii) the distortions that arise as the scheme is to put into everyday practice. The study shows that the administrations remains largely inaccessible to widows given its propensity towards withholding information, rigid procedural orientation, insensitivity to the urgent needs of people, etc.

Therefore, government intervention is needed for providing land rights and in providing widow pensions effectively.[16] This does not mean that government intervention should replace income and social support at the community level. They should be complementary to each other. Inspite of their significance, the problems of widows are rarely discussed in public fora. Thus the solution requires a combination of government intervention, public pressure, and community support.

Child Labourers

India has probably the largest number of child labourers in the world. Conventionally, a working child is defined

[16] For a recent exposition on the condition of widows in India see Chen (1998).

as a child in the range of 5 to 14 years of age who is doing labour, either paid or unpaid. Based on this definition, estimates of the number of working children range from 10 to 15 million in the censuses and NSS data to 44 million according to the Operations Research Group, a private agency. The Chamber of Commerce and Industry estimates child labour in the organized, unorganized, and household sectors in India to be over 100 million.

We should, however, define a working child as one who is deprived of the right to education and childhood. The child population can be grouped into three categories: schoolgoing children, child labourers, and the rest. Thus the rest are counted as non-labourers and non-school goers. According to NSS data, the last category forms about 50 per cent of the total and these should be considered as potential child labourers. Therefore the child labour problem should address not only the category of child labour but also the non-labour and non-school goer category.

Determinants of Child Labour

The classic defence offered by apologists for child labour is that it is caused by poverty.[17] It is true that poverty is one of the main determinants of the supply of child labour. The policy prescriptions for this are to have income generating programmes for parents of working children, payment of minimum wages to the poor, etc. However, the economic dependence of the families is only part of the explanation for the persistence of child labour. Across states, there is no correlation between incidence of poverty and incidence of child labour. Some time utilization studies for children suggest that most of the children who are not attending school are not doing much work either. Also, the direction of causation does not necessarily run from child labour to non-attendance. This can be other way round in the sense that dropout children take up productive work of their own choice or through parental pressure as a 'default occupation' (Drèze, 1997). A case study on Calcutta finds that two-thirds of working children 'work as they have nothing else to do as the schools are not very attractive and teaching conditions are poor'. Thus the schooling system is partly responsible for the persistence of child labour.

While children contribute to the earnings of the family, albeit in an insignificant way, the real malaise is that there is no corresponding skill advancement of the child labourer during her/his tenure of employment. The causal relationship sought to be established between poverty and child labour spawns and perpetuates poverty as children become part of the intergenerational cycle of exploitation and deprivation. All evidence from the field indicates that children who are working in industry from an early age burn themselves out by the time they are 30 or 35. They have not had any education worth the name and their health is severely impaired. Often, in situations like these, are heavily indebted.

The Approach of the Government

The Indian constitution is sensitive to the rights of children. According to Article 24 of the Constitution of India, regarding fundamental rights, 'No child below the age of fourteen years shall be employed to work in any factory or mine or engaged in any other hazardous employment'. According to Article 45 of the Constitution, the state is directed to provide 'free and compulsory education for all children until they complete the age of fourteen years'.

The government's strategy since the early 1980s has been guided by the view that child labour is a 'necessary evil' and a product of poverty, social discrimination, economic exploitation, etc. The National Policy on Education calls for a large and a systematic programme of non-formal education as an alternative for the large number of children who do not attend school full time. Only in recent years, has there been some emphasis on compulsory education.

Need for Compulsory Education

The establishment of compulsory education for children is a necessary condition for the reduction and abolition of child labour. In a narrow sense compulsory education is understood as a law making it compulsory for parents to send their own children to school and allowing for punishment of parents who do not comply. In a broad sense compulsory education may be interpreted as '(a) a compulsion on the state to provide adequate schooling facilities to all children, and (b) subject to that, an obligation of the parental community to send all children to school. Thus understood "compulsory education is a broad notion" [Drèze, 1997]'. The most important thing is that compulsory education would put much needed pressure on the state to expand schooling facilities. The argument against compulsory education is that it leads to official harassment of parents and poor families lose earnings from child labour. It may be noted that non-coercive means can be used for promoting compulsory education. The girl child will be particularly be benefited from the establishment of compulsory education.

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[17] In a non-poor high wage society parents might not send their children to work. See Basu and Van (1998) for a theoretical framework.

CONCLUDING COMMENTS

More than a third of India's population continues to be below the official poverty line. Prevalence of illiteracy and inadequate health facilities add to the vulnerability of a majority of the population. Poverty alleviation in the short run requires substantial government intervention and has been followed in India along three lines, viz. credit, employment, and food. Various other programmes have targeted the non-poor but vulnerable groups such as widows, elderly, and child labourers. The process of economic reforms which has turned the terms of trade in favour of agriculture has resulted in higher food prices. Real wages adjust to higher food prices with a lag, and during this transition period it is important that the poor, both rural and urban, be protected from the effects of rising food prices.

However, the long-term strategy against poverty must depend on augmenting income generating opportunities, and also increasing agricultural productivity and ensuring healthy economic growth. This requires a market-based approach with attention to non-price factors such as infrastructure, including both physical and human (education), institutions, and technology, where the government would continue to play an important role.

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4

Primary Education for All

Madhura Swaminathan and Vikas Rawal

INTRODUCTION

Fifty years after Independence, the slow progress of education—particularly primary education—in India is a matter of deep shame. India holds the world record for the number of illiterate persons. In 1991, there were 321 million illiterate people in the country (125 million males and 196 million females). The number of illiterate people today exceeds the population of the country at Independence. It is essential that the state implement a policy of universal and compulsory schooling. While we argue that governments must be held responsible for providing school education to every child, all sections of society have to play a role if this is to be made a reality.

WHY EDUCATION?

Even though widely known, it is worth reiterating the fundamental reasons for promoting universal primary education. Education is of value in itself (intrinsic value) and valued for what it can do (instrumental value). Jean Dreze and Amartya Sen (1995) provide a useful classification of the benefits of education. Education is desired for itself as it opens up a vast world of opportunities and ideas to the educated person. It is also of great instrumental value in the process of economic growth and development. Education plays a critical role in demographic transition; female education, in particular, is seen to be important in the process of lowering fertility and mortality. Primary schooling is associated with better health outcomes. There is strong correlation between literacy and life expectancy. An educated and skilled workforce contributes to higher economic growth. It is found, for example, that the skills of literacy and numeracy can improve worker productivity and affect the allocation of inputs. Schooling has been seen to have a positive impact on agricultural output. In political and social terms too, schooling creates an educated population and a more constructive citizenry. Education empowers and through empowerment affects larger social processes.

A good example of how education is both an end in and a means to development is the following. Ending illiteracy and expanding education among women is a goal of the development process as it expands women's capabilities. At the same time, education enhances women's agency and ability to participate in and contribute to the process of development. Note also that the relationship between education and development is a dialectical one. As has been shown, the spread of education in Kerala was important in breaking the barriers of caste, class, and gender just as reduction in caste, class, and gender discrimination contributed to the spread of education (Ramachandran, 1996).

Putting together all these benefits, it is not surprising that the returns to education are large and positive. The rate of return is calculated by comparing the stream of benefits from education, mainly earnings, with the stream of costs. In the case of private returns, only private costs including the opportunity costs of schooling are included whereas in the calculation of social return, the true resource cost of schooling is also included. There are some interesting features that emerge from the extensive literature on returns to education (Tilak, 1995). First, the social and private returns to education are high. Second, private returns to education

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are generally higher than social returns to education. Third, returns to primary education are greater than returns to other higher levels of education. Lastly, returns to education are higher than, or at least comparable to, returns to physical capital.

Given the importance of education, the question of its quality is also significant. Studies from the developing countries indicate that the quality of schooling matters. Specifically, evidence suggests that 'the lower the per capita income of the country, the weaker the influence of socio-economic background, and the greater the effect of school and teacher quality on pupil achievement' (Colclough and Lewin, 1993, 34). Among the components of quality of schooling, teachers and textbooks are shown to be critical factors. Based on thirty-two different studies, it was found that the level of education, formal training, and experience of teachers made a positive impact on the achievement of pupils (Husen et al., 1978, cited in Colclough and Lewin, 1993). The lesson to be drawn is that we need to 'improve both the quality as well as the quantity of primary-school provision' (Colclough and Lewin, 1993, 35).

WHAT HAVE WE ACHIEVED?

The Indian population is characterized by a low overall rate of literacy—52 per cent in 1991 (64 per cent for males and 39 per cent for females). Newly available data from the fifty-third round of the National Sample Survey (NSS) indicate that the overall rate of literacy has risen to 62 per cent (73 per cent for males and 50 per cent for females) in 1997. There are, however, wide variations across regions, states, castes, classes, and sexes. In 1991, the highest male literacy rate was 94 per cent in Kerala whereas Arunachal Pradesh and Bihar had the lowest male literacy rates—51 and 52 per cent respectively. Among women, the highest rate of literacy was 86 per cent in Kerala and Rajasthan had the lowest rate of 20 per cent. In other words, only one in every five women in Rajasthan was literate in 1991. In rural Rajasthan, literacy was even lower: only 11.6 per cent of rural females were literate. Traditionally deprived communities such as the scheduled castes and scheduled tribes remain backward educationally. Among scheduled castes, only 46 per cent of males and 19 per cent of women were literate; the corresponding figures for scheduled tribes were 41 and 18 per cent. Literacy was extremely low among groups that suffered from multiple forms of deprivation. Only 4 per cent of scheduled tribe women in Rajasthan, for example, were literate. Among agricultural labourers, in 1993–4, only 40 per cent of males and 16.8 per cent of females (above the age of 15) were literate.

The problem is not one of adult illiteracy alone. Among children too, there are large numbers who do not attend school. According to official data, the primary school gross enrolment ratio (or ratio of children enrolled in school to population of schoolgoing age) averaged 113 per cent for boys and 91 per cent for girls for the years 1990–4. Since there are huge problems with official data, we prefer to use data collected by the NSS. In Table 4.1, we report school attendance rates for the age group 5–14 for boys and girls separately and for rural and urban areas of different states for the year 1987–8. In Table 4.2, we report information on the proportion of children currently attending school in 1993–4, based on data from the fiftieth round of the NSS. The two sets of findings are not strictly comparable, as the question on attendance seems to have been posed differently in the two rounds of the NSS. Nevertheless, a measure of progress can be inferred from the two surveys.

In 1987–8, the all India figures showed that about 40 per cent of rural children and 74 per cent of urban children were attending school. The data on school attendance show variations across states and rural and urban areas. With the exception of urban Kerala, attendance rates among girls were lower than among boys. The gender gap tends to be wider in rural areas. In rural Uttar Pradesh, for example, 33 per cent of boys and 16 per cent of girls attended school in 1987–8. In general, attendance rates were very low in Bihar, Madhya Pradesh, Rajasthan, and Uttar Pradesh, or what have been termed the BIMARU states. Only 25 per cent of boys and girls in rural Uttar Pradesh attended school as compared to 89 per cent in Kerala. School attendance was also low in Haryana, Orissa, and Jammu & Kashmir. In Punjab, one of the richest states, only 35 per cent of rural children attended school.

While the data for 1993–4 show tangible progress, schooling is far from being universal. In rural areas, 70 per cent of boys and 55 per cent of girls in the 5–14 age group attended school. In urban areas, 84.5 per cent of boys and 80 per cent of girls attended school. So even in urban areas, about 20 per cent of girls were not in school and the proportion was twice as high in rural areas. Turning to state-level changes, remarkable progress was made between 1987–8 and 1993–4 in Himachal Pradesh, where achievements in 1993–4 came close to those of Kerala. There was also notable progress in Punjab and Haryana, relatively rich states that had lagged behind in terms of educational achievement. In general, the pace of change in urban areas was slow. In rural areas, where initial attendance was low, there was rapid increase in attendance in many states, including the BIMARU states where attendance rates doubled or more

TABLE 4.1
Proportion of Children Attending School, Aged 5–14, 1987–8

State	Rural			Urban		
	Male	Female	All	Male	Female	All
Andhra Pradesh	60.36	38.73	49.66	79.51	69.63	74.57
Assam	62.38	58.97	60.84	82.36	75.69	79.45
Bihar	34.90	19.77	34.90	63.66	54.25	59.42
Delhi	69.70	39.14	56.57	87.12	82.69	85.01
Gujarat	69.63	52.31	61.44	77.21	75.51	76.42
Haryana	43.19	26.43	35.54	83.45	74.77	79.72
Himachal Pradesh	47.51	37.28	42.55	91.99	89.79	91.06
Jammu & Kashmir	37.93	22.84	30.38	77.30	70.69	74.16
Karnataka	60.92	48.10	54.55	74.22	71.23	72.72
Kerala	90.43	87.09	88.80	93.40	93.43	93.41
Madhya Pradesh	32.33	22.60	27.82	79.94	70.29	75.39
Maharashtra	71.65	55.02	63.87	84.92	80.00	82.54
Orissa	29.90	20.01	25.02	78.99	68.76	74.12
Punjab	38.35	31.25	35.08	83.20	80.99	82.14
Rajasthan	35.50	10.20	24.04	75.28	54.94	65.84
Tamil Nadu	55.27	41.43	48.47	84.48	77.71	81.16
Uttar Pradesh	32.92	15.87	25.30	65.02	54.80	60.24
West Bengal	48.12	42.15	45.27	72.22	68.01	70.20
All-India	46.47	32.25	39.80	76.96	70.00	73.64

Note: Attendance rates in the NSS survey results have been reported for ages 5–9 and 10–14. Attendance rates for ages 5–14 are weighted averages of the attendance rates for age groups 5–9 and 10–14.
Source: Ramachandran, Rawal, and Swaminathan (1997), Table 3.

TABLE 4.2
Proportion of Children Currently Attending School, Aged 5–14, 1993–4

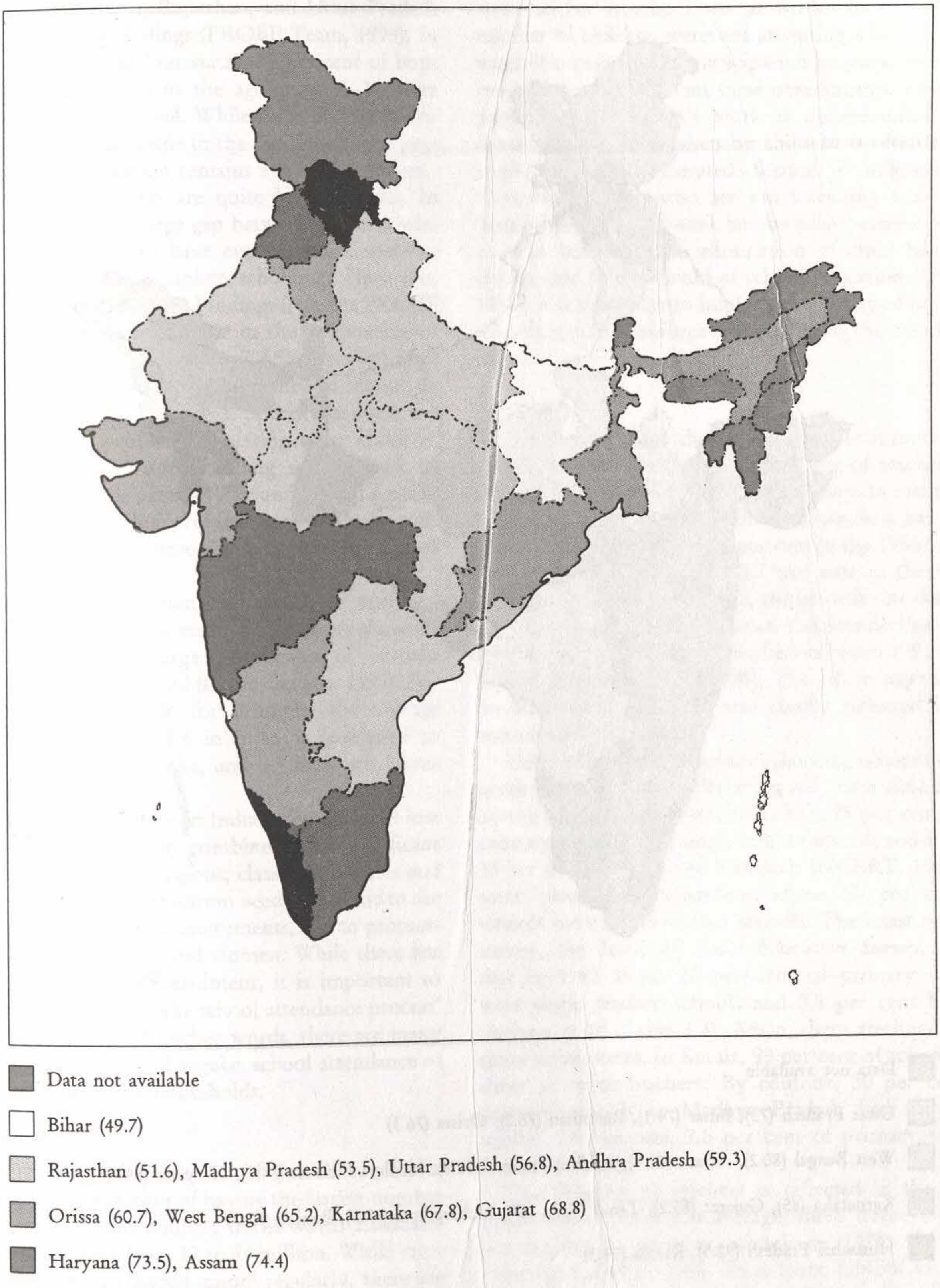
State	Rural			Urban		
	Male	Female	All	Male	Female	All
Andhra Pradesh	68.0	50.8	59.3	85.4	80.0	82.8
Assam	75.8	72.6	74.4	82.0	80.7	81.4
Bihar	58.4	38.6	49.7	76.1	71.7	74.1
Gujarat	75.9	60.6	68.8	86.7	83.7	85.2
Haryana	80.2	66.0	73.5	83.3	86.6	84.7
Himachal Pradesh	90.2	82.0	86.0	91.9	93.2	92.5
Karnataka	73.0	62.3	67.8	86.1	84.0	85.0
Kerala	92.5	93.9	93.2	95.5	93.0	94.3
Madhya Pradesh	61.4	44.2	53.5	87.0	81.2	84.3
Maharashtra	82.8	73.0	78.1	89.1	85.3	87.3
Orissa	66.9	54.0	60.7	80.7	72.0	76.3
Punjab	79.6	72.8	76.5	88.2	87.1	87.7
Rajasthan	68.3	31.4	51.6	81.8	69.6	76.2
Tamil Nadu	82.6	74.0	78.4	87.6	86.4	87.0
Uttar Pradesh	66.7	44.5	56.8	77.2	68.1	73.0
West Bengal	68.9	61.2	65.2	84.5	76.3	80.2
All-India	70.3	55.4	63.3	84.5	80.0	82.4

Source: NSSO (1997), Table 4.3.1.

than doubled between 1987–8 and 1993–4. Nevertheless, the overall situation remains far from satisfactory (see Maps 1 and 2).

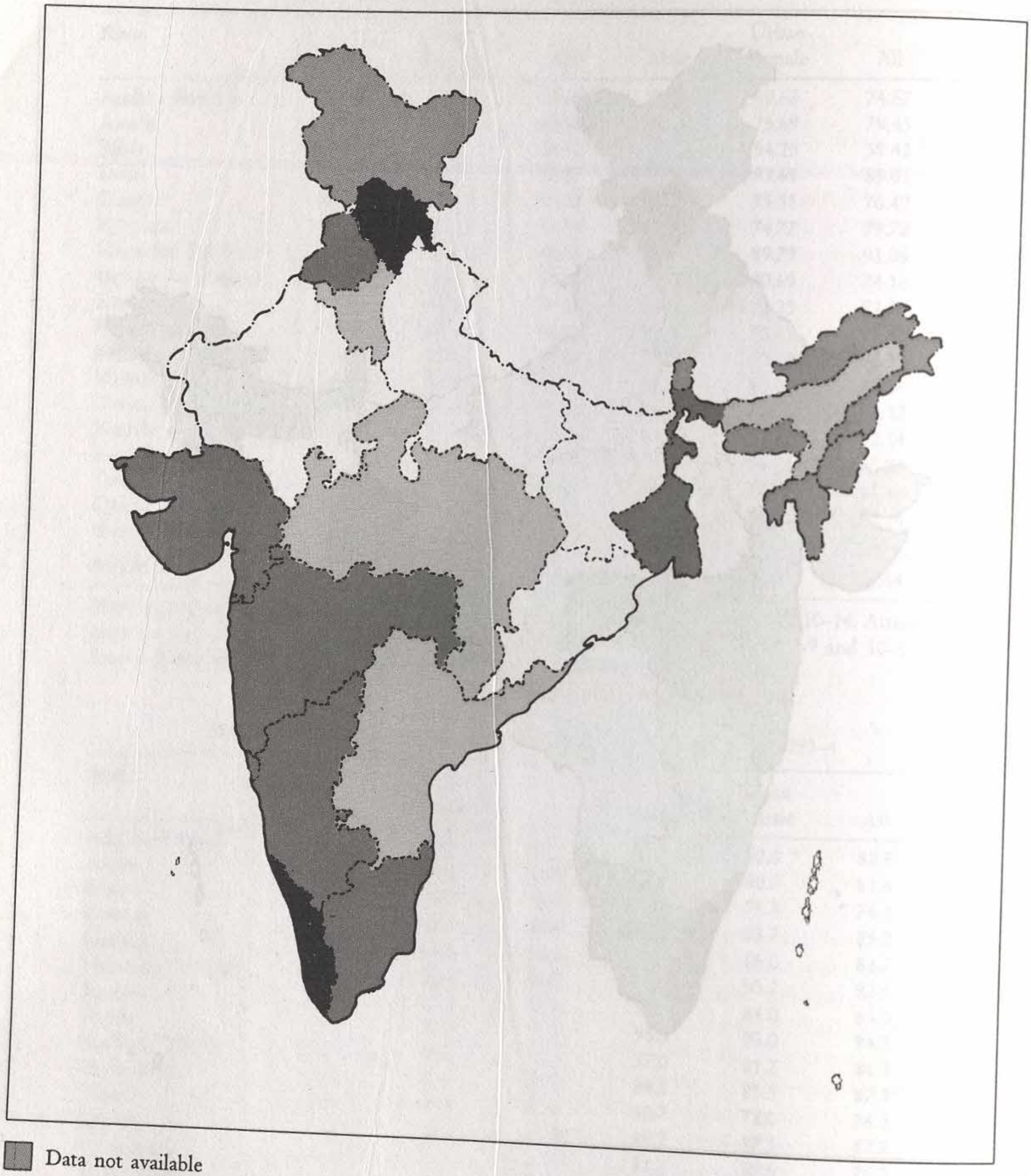
Village studies vividly bring out the problems of low school attendance. In Palanpur village in western Uttar Pradesh, in 1993, 29 per cent of children were enrolled in the primary school in the village. Among girls, 20 per cent were officially enrolled but the researchers observed that only 4 per cent actually attended school (Dreze and Saran, 1993).

MAP 1
Enrolment Rates for Children Aged 5 to 14, India, Rural, 1993–1994


Data not available
Bihar (49.7)
Rajasthan (51.6), Madhya Pradesh (53.5), Uttar Pradesh (56.8), Andhra Pradesh (59.3)
Orissa (60.7), West Bengal (65.2), Karnataka (67.8), Gujarat (68.8)
Haryana (73.5), Assam (74.4)
Punjab (76.5), Maharashtara (78.1), Tamil Nadu (78.4)
Himachal Pradesh (86), Kerala (93.2)

MAP 2

Enrolment Rates for Children Aged 5 to 14, India, Urban, 1993–1994



▨ Data not available

☐ Uttar Pradesh (73), Bihar (74.1), Rajasthan (76.2), Orissa (76.3)

☐ West Bengal (80.2), Assam (81.4), Andhra Pradesh (82.8), Madhya Pradesh (84.3), Haryana (84.7)

▨ Karnataka (85), Gujarat (85.2), Tamil Nadu (87), Maharashtra (87.3), Punjab (87.7)

■ Himachal Pradesh (92.5), Kerala (94.3)

The recent PROBE (Public Report on Basic Education) survey of 200 villages in the four northern states of Bihar, Madhya Pradesh, Rajasthan, and Uttar Pradesh has some interesting findings (PROBE Team, 1999). In the rural areas of these four states, 86 per cent of boys and 57 per cent of girls in the age group 6–14 were currently enrolled in school. While these findings show that progress has been made in the last decade, the provision of a basic education remains a critical problem.

Further, dropout rates are quite high in India. In other words, there is a large gap between children who enrol in school, or who have ever attended, and the number who actually complete schooling. Here too, there has been some progress. Findings from the PROBE survey point to a sharp decline in the proportion of 'never-enrolled' children. In 1986–7, 55 per cent of rural children aged 6 to 14 had never enrolled in school; in 1996, the figure was 19 per cent. Special attention has to be paid to the problem of getting older children, currently working or not attending school, back to school. The experience of the MV Foundation in Andhra Pradesh shows that this problem can be dealt with through specific programmes such as summer camps (Sinha, 1996).

The average achievement in terms of years of schooling is very low as a result of the short duration of schooling and the large proportion of persons who never enrolled in school (Dreze and Sen, 1995). For the population above 25, for example, the average years of schooling were 2.4 in India as compared to 5 in China, 7.2 in Sri Lanka, and 9.3 in South Korea (Dreze and Sen, 1995).

To sum up, the situation in India today is one of low achievements in education combined with significant inequalities across sexes, regions, classes, and castes and communities. Particular attention needs to be paid to the gender gap in educational achievements, and to promoting the education of girls and women. While there has been progress in school enrolment, it is important to recognize the 'fragility of the school attendance process' (PROBE Team, 1999). In other words, there are many obstacles to continued and regular school attendance of children from deprived households.

Child Labour

A closely related problem is that of child labour. India has the dubious distinction of having the largest number of child workers of any country in the world. Estimates of child workers vary from 17 to 44 million. While most child workers do not attend school regularly, there are also children who are neither at school nor working. According to NSS data for 1993–4, for example, of rural boys in the age group 10 to 14, 76 per cent attended school, 11.7 per cent were workers, and 10.6 per cent were neither at school nor at work. So a substantial number of children were not attending school but this was not on account of participation in work. There are two points to note about these observations. First, it is possible that children's work is undercounted. Like women, work undertaken by children is often hidden work and not enumerated. Second, it indicates that there are children who are not attending school not because they have to work but for other reasons. Suffice to note here that the elimination of child labour is closely tied to the spread of school education (Weiner, 1991). It is also easier to implement a policy of universal schooling than to enforce laws regulating the use of child labour.

Teachers

Teachers are perhaps the most important resource in a school. In absolute terms, the number of teachers has expanded greatly over the last fifty years. In real terms, however, the growth in number of teachers has fallen steadily over time, from 5.6 per cent in the 1950s, to 4.5 per cent in the 1960s, and 2.7 per cent in the 1970s. Between 1984–5 and 1989–90, the growth rate dropped to 1.6 per cent, and there was an absolute decline in the number of primary school teachers between 1991–2 and 1992–3 (Dreze and Sen, 1995). The fall in expenditure on education after 1991 was clearly reflected in the recruitment of teachers.

There is little doubt that the schooling system in India needs more teachers. The *Fifth All India Educational Survey* conducted in 1986 found that 28 per cent of all primary schools were single teacher schools and another 32 per cent had two teachers each (NCERT, 1992). In some places, like Rajasthan, about 50 per cent of schools were single teacher schools. The latest national survey, the *Sixth All India Education Survey*, shows that in 1993 about 20 per cent of primary schools were single teacher schools and 0.8 per cent had no teachers at all (Table 4.3). Again, there are huge variations across states. In Kerala, 99 per cent of schools had three or more teachers. By contrast, 30 per cent of primary schools in Madhya Pradesh had only one teacher. In Haryana, 2.5 per cent of primary schools had no teachers.

The shortage of teachers is reflected in the rising pupil–teacher ratio. On average, there were 41 pupils per teacher in primary schools in 1978; the ratio went up to 44 in 1986. Data from UNESCO documents indicate a rising pupil–teacher ratio. The current student–teacher ratio in India is a league apart from those observed in other countries, including other developing countries (Figure 4.1). In China, a country that has been successful in implementing universal education, the pupil–teacher ratio was 22. The ratio was 19.8 in Thailand, 20 in Malaysia, 36 in the Philippines, and 39 in Nepal. By contrast, the figure for India for 1994 was 63.5.

Another area of concern is teacher performance and, in particular, the 'widespread problem of teacher inertia' (PROBE Team, 1999). The two major factors responsible for poor performance, as the PROBE study reports, are the 'demotivating environment' in which teachers work and the lack of accountability in the schooling system (Probe Team, 1999). It is unlikely for work motivation to be high and teacher performance to be good when a teacher single handed, and with little teaching material, has to teach five different grades at the same time.

Deplorable State of School Infrastructure

The quality of school infrastructure in the country is deplorable (though this is not surprising given the low level of expenditure). The *Fifth All India Educational Survey* conducted in 1986 found that 40 per cent of schools did not have a *pucca* (permanent) building and 9 per cent had no building at all (NCERT, 1992). The

TABLE 4.3

Distribution of Primary Schools by Number of Teachers, 1993

	Number of Teachers				
	0	1	2	> 3	Total
Lakshwadweep	0.0	0.0	0.0	100.0	100
Kerala	0.1	0.1	0.7	99.1	100
Delhi	0.6	0.5	0.9	98.1	100
Daman & Diu	0.0	0.0	3.3	96.7	100
Chandigarh	0.0	0.0	7.1	92.9	100
Sikkim	0.0	1.5	6.3	92.2	100
Nagaland	0.0	7.0	14.0	78.9	100
Pondicherry	0.0	5.7	22.1	72.2	100
Tripura	1.1	7.6	25.0	66.2	100
Mizoram	0.0	15.4	20.0	64.6	100
Manipur	0.0	19.0	21.2	59.8	100
West Bengal	0.2	7.2	33.1	59.5	100
Uttar Pradesh	0.5	9.3	34.2	56.0	100
A & N Islands	0.0	11.2	33.5	55.3	100
Punjab	0.0	11.5	36.7	51.8	100
Tamil Nadu	0.0	12.7	35.8	51.5	100
Haryana	2.5	15.6	33.3	48.6	100
India	0.8	20.1	41.9	37.2	100
Goa	0.0	17.0	46.8	36.2	100
Rajasthan	0.3	28.6	37.9	33.2	100
Orissa	0.0	17.0	50.0	33.0	100
Maharashtra	0.1	18.3	51.0	30.7	100
Madhya Pradesh	0.6	30.4	38.7	30.3	100
Assam	0.0	20.9	49.1	30.0	100
Himachal Pradesh	1.0	21.2	51.5	26.2	100
Meghalaya	0.0	37.1	38.0	24.9	100
Bihar	1.9	22.0	53.0	23.1	100
Andhra Pradesh	2.8	33.5	42.7	21.0	100
Arunachal Pradesh	0.6	45.5	34.9	19.0	100
Gujarat	0.8	28.8	56.9	13.5	100
Jammu & Kashmir	0.8	35.3	51.7	12.3	100
Karnataka	2.1	27.7	61.7	8.5	100
Dadra & Nagar Haveli	0.0	50.4	43.2	6.4	100

Note: Note Ranked by col. 5.

Source: Sixth All India Educational Survey, 1997.

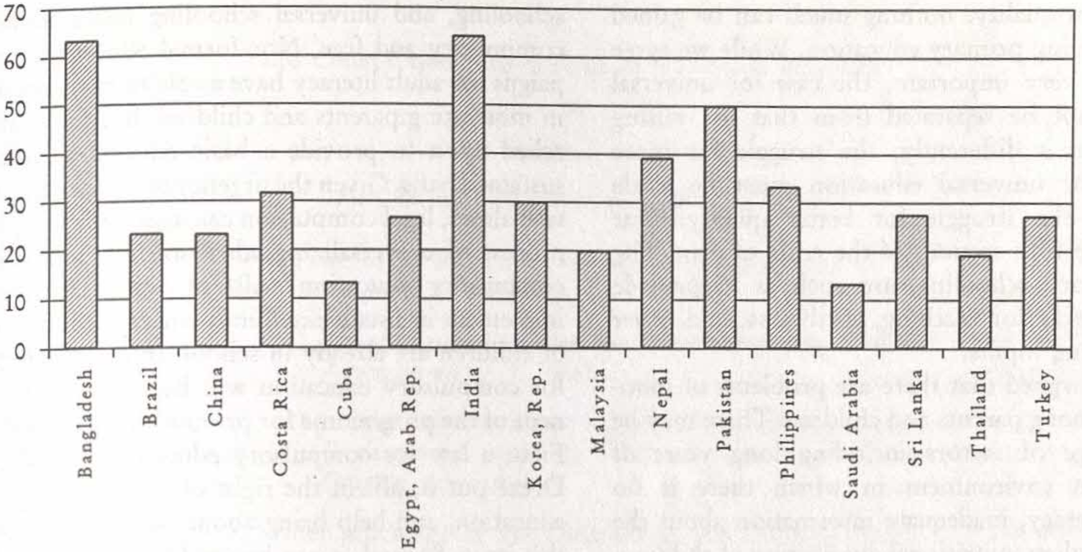


Figure 4.1 Pupil–teacher Ratio in Primary Schools in Different Countries, 1994

availability of other basic facilities was also limited: 60 per cent of schools had no drinking water and 89 per cent no toilets. In terms of educational materials, 40 per cent of schools had no blackboards and 70 per cent no library facilities. Six years later, we find very little change (NCERT, 1997). In 1993, 65 per cent of all schools had a *pucca* building. At the other extreme, 4 per cent of schools were run in open spaces, 3 per cent in thatched huts, and 0.3 per cent in tents. Further, 56 per cent of schools had no drinking water facilities and 70 per cent no toilets.

It is clear that expansion of primary education requires large-scale expansion of basic school infrastructure and upgrading of facilities in existing schools. As governments and local bodies run the majority of schools (92 per cent), the state has primary responsibility for bettering the quantity and quality of schools.

COMPULSORY EDUCATION

Why are all children not in school? This question has been widely discussed, and we do not attempt to review the vast literature and multiplicity of views. However, the following three factors are commonly acknowledged to be important obstacles to universal primary education. First, there is the problem of poverty. The poor, it is argued, cannot afford to send their children to school. In some cases, children may be employed as child workers and contribute to the family's earnings (an explicit opportunity cost of sending children to school). As the incidence of child labour is not correlated with the incidence of poverty across states, the literature suggests that child labour is not on account of poverty alone. While it is the children of the poor who work, there are important demand side factors that determine the pattern of child labour use. Also, a significant proportion of children not in school are also not working. So child labour cannot entirely explain low school attendance.

More importantly, the costs of education may be too high for poor parents. Even in government schools with no tuition fees, there are other costs such as those of uniforms or textbooks. The PROBE survey found, for example, that on average, the expenditure on fees, books, slates, and uniforms for a child was Rs 318 a year. This is a high level of expenditure relative to income for many households such as that of an agricultural labourer. The costs of schooling deter poor parents. In such cases, free schooling and incentives such as free meals and books are needed to overcome the problem of non-attendance.

A second reason pertains to the quality of schooling and school infrastructure. In India, as described above, school infrastructure is woefully inadequate. For many children, the absence of a functioning school in the neighbourhood is the main determinant of non-attendance. The problems of physical distance from a school are exacerbated by problems of social distance for children from underprivileged households (PROBE Team, 1999). Given that the average quality of schooling is very low, a frequently cited argument is that education of such poor quality is of little use. The low quality of education is blamed for low school enrolment and the high dropout rate. While these statements are valid, it is wrong to argue, as is often done, that without an improvement in quality, nothing much can be gained from universalizing primary education. While we agree that quality is very important, the case for universal education cannot be separated from that for raising quality. To put it differently, the struggle for more schools and for universal education must be made together with the struggle for better quality. Our estimates in the fifth section, of the costs of providing universal primary schooling, are such as to provide adequate resources for teaching, textbooks, and other quality-enhancing inputs.

Lastly, it is argued that there are problems of motivation, both among parents and children. These may be due to a range of factors including long years of deprivation, an environment in which there is no tradition of literacy, inadequate information about the returns to schooling, nutritional deprivation of children, low quality of school education, and so on. Empirical studies, however, indicate a high level of motivation among poor parents. The recent experience of the MV Foundation in Andhra Pradesh shows that even poor parents are willing to send their children to school (Sinha, 1996). Parents are willing to take on extra work to see that their children go to school. In other words, there is demand for schooling even among poor parents and poor children.

One of the most striking findings from the PROBE survey is that there is a great deal of motivation for education among parents (Skinner, 1998; PROBE Team, 1999). To the question of whether it is important to educate a boy, 100 per cent of parents answered in the affirmative. When asked about the education of girls, as many as 89 per cent of parents answered positively. Most parents also wanted eight years of education for their children. The PROBE findings clearly refute an assumption of parental indifference to children's schooling. However, children were not in school for a variety of reasons including the costs of schooling, lack of time in the morning to prepare the child for school, and inability to help with homework. Further, the initial enthusiasm for school often waned with the children's negative experience of school such as the absence of classroom activity and physical punishments. The low quality of school infrastructure and poor learning environment affected school attendance and retention.

The discussion above shows that commonly cited 'demand-side' obstacles to school attendance can be overcome by the 'supply' of good quality and free education in the neighbourhood.

The Case for Compulsory Schooling

Given all these factors, we argue that in today's situation, universal education requires universal formal schooling, and universal schooling needs to be made compulsory and free. Non-formal education and campaigns for adult literacy have a role to play, particularly in motivating parents and children, but they cannot be relied upon to provide a basic education to all on a sustained basis. Given the urgency and importance of the task ahead, legal compulsion can assist and accelerate the process of universalizing education in India. Laws for compulsory education will, of course, be easier to implement in a state like Kerala where the large majority of children are already in school. In other states, a law for compulsory education will be an essential component of the programme for promoting school education. First, a law for compulsory education would, as Jean Dreze put it, affirm the right of every child to school education, and help bring about national consensus on this issue. Second, it can be used by society to demand that the state provide education (Dreze, 1997). In other words, it can form the basis for expanding the educational infrastructure by putting pressure on the state. Third, compulsory education can be critical in reaching deprived sections of the community and in promoting female education. Even in a state like Kerala, that has been very successful in spreading education and literacy, there are sections of society (e.g. people of the scheduled tribes) that remain excluded from the education system (Ramachandran, 1996). Legal obligations can spread schooling to these excluded minorities. Similarly, legal compulsion can be used to deal with situations of parental negligence. Lastly, the task of eliminating child labour will be easier when all children are required to be in school.

In 1997, for the first time after Independence, the United Front government introduced a bill, the 83rd Constitutional Amendment Bill, to make schooling compulsory (see Box 1). The draft Bill was presented to the Rajya Sabha and laid on the Table of the Lok Sabha on 24 November 1997. The Bill states that this was in pursuance of the Common Minimum Programme of the United Front that resolved 'to make the right to free and compulsory elementary education a fundamental right and to ensure it through suitable statutory measures'. The Bill proposed to amend Article 21 by introducing the clause 'The State shall provide free and compulsory education to all citizens of the age six to fourteen years'. The draft Bill was circulated and discussed widely in the public arena but with the fall of the United Front government, the Bill is gathering dust. We urge the government to introduce and debate this Bill as soon as possible and to enact a law for compulsory education. After the Constitutional Amendment, state governments will have to enact suitable laws for compulsory education within a year. Tamil Nadu is the only state

Box 1

The Constitution (Eighty-third Amendment) Bill, 1997

A

BILL

Further to amend the Constitution of India

Be it enacted by Parliament in the Forty-eighth Year of the Republic of India as follows:

Short title and commitment

1. (1) This Act may be called the Constitution (Eighty-third Amendment) Act, 1997.

(2) It shall come into force on such date as the Central Government may, by notification in the Official Gazette, appoint.

Insertion of new article 21A

2. After article 21 of the Constitution, the following article shall be inserted, namely:

Right to education

"21A, (I) The State shall provide free and compulsory education to all citizens of the age six to fourteen years.

(2) The right to free and compulsory education referred to in clause (I) shall be enforced in such manner as the State may, by law, determine.

(3) The State shall not make any law, for free and compulsory education under clause (2), in relation to the educational institutions not maintained by the State or not receiving aid out of State funds."

Amendment of Article 35

3. Article 35 of the Constitution shall be renumbered as clause (1) of that article and after clause (1) as so renumbered and before the *Explanation*, the following clause shall be inserted, namely:

"(2) The competent legislature shall make the law for the enforcement of right to free and compulsory education referred to in clause (1) of article 21A within one year from the commencement of the Constitution (Eighty-third Amendment) Act, 1997:

provided that a provision of any law to free, and compulsory education in force in a State immediately before the commencement of the Constitution (Eighty-third Amendment) Act, 1997 which is inconsistent of article 21A, shall continue to be in force until amended or repealed by a competent legislature or other competent authority or until the expiration of one year from such commencement, whichever is earlier"

Omission of Article 45

4. Article 45 of the Constitution shall be omitted.

Amendment of Article 45

5. In article 51A of the Constitution, after clause (j) the following clause will be added, namely:

"(k) to provide opportunities for education to a child between the age of six and fourteen years of whom such citizen is a parent or guardian."

in India to have passed a law for compulsory education; it is yet to be implemented.

A different approach was taken in Madhya Pradesh, where an Education Guarantee Scheme was introduced in 1997 (Gopalakrishnan and Sharma, 1998). The government guaranteed the provision of a teacher, teacher training, and basic materials within 90 days of a request from a community for a primary school as long as there were a minimum of 40 children (25 in tribal areas). The responsibility for space or building rested with the community or panchayat. There are two noteworthy features of this experiment. On the positive side, the setting up of 15,568 schools in one year itself shows the tremendous demand for education among the poor and puts to rest all arguments about the poor not wanting formal education. On the negative side, the measly expenditure on the scheme (the 'Guruji' or teacher's monthly salary, for example, was only Rs 500 and children were given books worth Rs 25) leads to serious compromise on the quality of education. Unless adequate infrastructure is created, it will be difficult to sustain such an initiative. Such a scheme cannot substitute for the setting up of regular schools with adequate teacher and material resources. There are also concerns of equity as this may result in the creation of a two-track system of education.

The budget for 1990–2000 proposes to implement an Education Guarantee Scheme at the national level and to provide an elementary school within a kilometre of every habitation. While the proposal seems, at first, a step in the right direction, it has two major failings. First, there is no commitment of additional financial resources for the scheme. Second, it requires that a local community start a school and run it successfully for two years, with some minimal help from the government in terms of teaching materials and other unspecified assistance, before the government 'upgrades it on a permanent basis'. It is not clear if 'other' assistance includes even a basic salary for teachers and some teacher training. If such support is not provided, the proposal will shift the burden of provision of primary schooling from the state to poor communities. That is no solution to the problem.

CURRENT EXPENDITURE TRENDS

The task of providing primary education to each child in India is enormous and will undoubtedly require adequate resources. What are the patterns of expenditures on education in India, and what have been the trends in expenditures in recent years? What has been the impact of structural adjustment on expenditure on education? Public expenditure on education has been growing over the last fifty years but, as this section demonstrates, remains grossly inadequate in relation to the task at hand. Moreover, expenditure on education was *adversely* affected by the introduction of policies of structural adjustment in 1991.

As education is on the concurrent list, both central and state governments are responsible for education. Although the centre accounts for only a small share of total expenditure on education, around 12 per cent, it can be important in influencing the pattern of total expenditure and trends in expenditure. One of the major problems in examining expenditures on education is that there is no regular integrated account of expenditure by central and state governments.

We first look at available information on total spending by the central and state governments on education (Table 4.4). In the combined revenue budgets of the state and central governments, expenditure on education by education departments had a share of 11.27 per cent of total resources in 1987–8. This share fell in the early 1990s, reaching a low of 10.7 per cent in 1993–4. When expenditure by all departments is examined, the share of education rose till 1992–3 and then fell slightly. Similarly, in terms of share of GNP, expenditure on education increased steadily from 0.65 per cent in the 1950s to 3.55 per cent in 1992–3. In the 1990s, with a tight fiscal policy, expenditures on education rose very slowly in real terms and accounted for a lower share of GDP in most years than in 1987–8.

How does this compare internationally? Data from the *Human Development Report 1998* (in Table 4.5) show that India spent much less on education than East Asian countries such as Korea, Thailand, and Malaysia. These countries also allocated a higher share of budgetary resources to education than India, and the share of primary and secondary education in total spending on education was also higher.

Next, let us look at expenditure by the central government, as these data are more easily available and more up to date. In constant prices, total expenditure on education *fell* with the introduction of economic reforms in 1991–2 and 1992–3 (Figure 4.2). The trend was reversed in 1993–4 but expenditure exceeded that of 1990 only in 1994–5. Clearly, economic reforms exacted a toll from the education sector. Expenditure on elementary education was, however, maintained in the first few years of the reforms. In recent years, it has been observed—and this is extremely worrying—that actual spending on social sectors is lower than budgeted expenditures. In 1997–8, for example, the government

TABLE 4.4

Total Expenditure of Central and State Governments on Education, 1951–2 to 1996–7

State	Expenditure on education by education departments		Expenditure on education by all departments			
	In Rs million	As per cent of budget	In Rs million	As per cent of Budget	As per cent of GDP	In constant 1980–1 prices
1951–2	645	7.92	645	7.92	0.65	3053
1961–2	2603	11.7	2603	11.7	1.52	10,716
1971–2	9948	9.38	10,110	9.53	2.19	22,556
1981–2	37,901	9.09	42,990	10.31	2.69	38,991
1986–7	84,503	10.5	94,790	11.78	3.24	59,942
1987–8	104,302	11.27	117,980	12.75	3.54	68,772
1991–2	187,576	11.01	214,340	12.58	3.48	83,837
1992–3	209,530	11.01	250,300	13.15	3.55	90,265
1993–4	234,131	10.71	282,800	12.94	3.49	93,125
1994–5	272,301	10.82	326,060	12.95	3.42	115,495
1995–6 (RE)	324,587	11.07	390,180	13.3	3.55	125,953
1996–7 (BE)	365,293	11.23	434,120	13.35	3.40	131,142

Notes: RE = Revenue estimates; BE = Budget estimates.
Source: University News, 36938, 21 September 1998.

TABLE 4.5

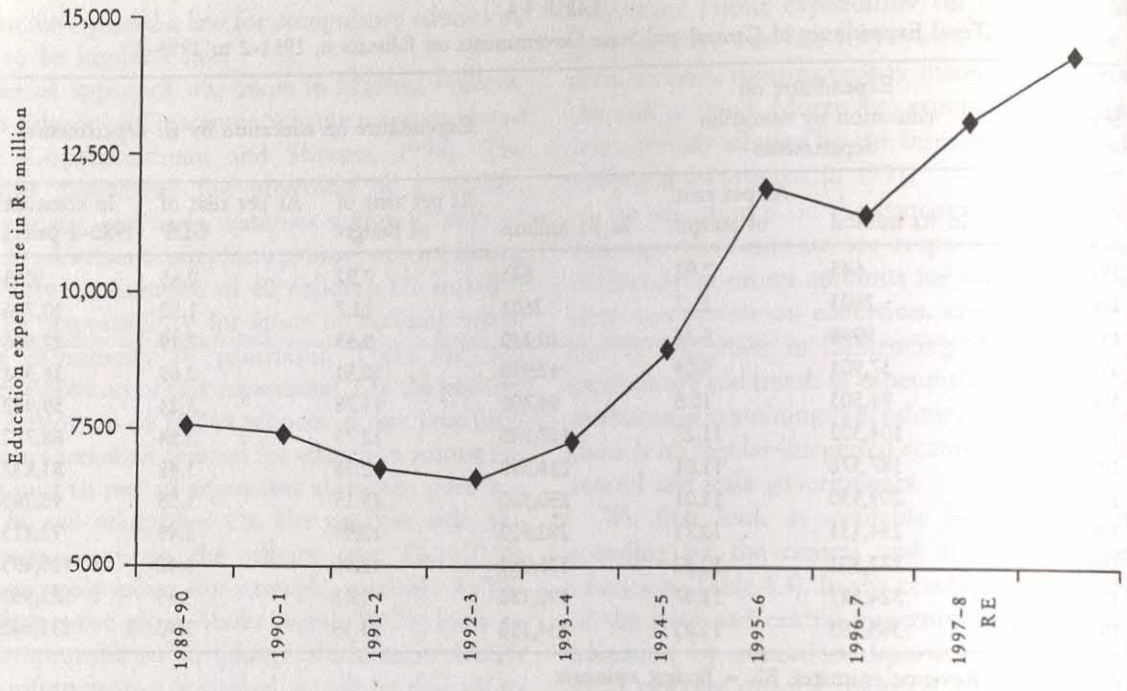
Public Expenditure on Education

Country	Public expenditure on		
	Education (as % of GNP) 1995	Education (as % of total government expenditure) 1993–5	Primary and secondary education (as % of all levels) 1990–5
Bangladesh	2.3	8.7	88
China	2.3	12.2	67
Egypt	5.6	13.8	64
India	3.5	12.1	65
Iran	4	17.8	63
Kenya	7.4	16.1	82
Korea	3.7	17.4	79
Malaysia	5.3	15.5	76
Sri Lanka	3.1	8.1	73
Thailand	4.2	20.1	73

Note: The figures for China may not be comparable due to differences in the system of accounting.
Source: UNDP, *Human Development Report 1998*.

budgeted for an expenditure of Rs 25,431 million on elementary education but the revised estimates show an expenditure of Rs 22,668 million. So the government failed to even spend the amount that had been budgeted for. In terms of the share of total plan outlay by the central government, the share of education fell after 1990–1 and recovered only in 1995–6.

Thus India too followed the pattern observed in other developing countries that undertook structural adjustment programmes, namely cutbacks in expenditure on social sectors including education. The extent of fall in public expenditure on education was, however, less drastic in India than in many other countries (Noss, 1991; Rose, 1995). This can be attributed to political pressure from opposition political parties, from people's organizations, and from scholars and activists to protect the poor from the adverse effects of public expenditure cuts.



Notes: RE = Revenue estimates; BE = Budget estimates.
Figure 4.2 Total Central Government Expenditure on Education 1989–90 to 1998–9 (at 1980–1 prices)

FINANCING UNIVERSAL PRIMARY EDUCATION

Given the urgency of making school education, at least primary school education, available to every child in India, it is important to estimate the financial costs of a commitment to universal primary education. Ramachandran, Rawal, and Swaminathan (1997) (henceforth referred to as RRS), proposed a set of preliminary state-wise estimates of the costs of schooling all children in the age group 6–11 years. The basic methodology involved the estimation of the unit cost of primary schooling and then the estimation of the total cost based on the number of children not attending school. Here we update the RRS estimates with newer information on school attendance and school age population. The methodology is not discussed here but we should point out that information was not available on all the desired parameters. The approach, however, gives us some ballpark figures.

The information used to arrive at unit costs is shown in Box 2. V. K. Ramachandran constructed these unit costs for the state of West Bengal for the year 1995 (Ramachandran, 1998). As an approximation, we have used the estimates for West Bengal for all states and all-India calculations. For a primary school comprising 150 children, 5 teachers and 5 classrooms, the unit capital cost was estimated at Rs 2500 at 1995 prices and unit recurrent cost was estimated at Rs 1593. These figures incorporate elements of minimum quality in terms of pupil–teacher ratio, number of classrooms, and provision of textbook, and other resource materials.

To arrive at the total costs of primary education, we estimated the number of children in the 6–11 age group who were/were not attending school (using the 1993–4 attendance rates for the 5–14 population and population projections for the 6–11 age cohort). For children not in school, the additional cost comprises total unit cost (capital cost and recurrent cost) as shown in Box 2. For children currently in school, we allowed for an improvement in quality and allowed for 50 per cent of the estimated unit capital cost for this improvement; the recurrent cost is assumed to be the same for all children. To simplify, we have assumed that the capital cost is spread over five years. In short, the estimate of total annual expenditure required for universal primary schooling (Table 4.6) is based on the following three components:

(a) expenditure on the creation of infrastructure for children who are currently out of school over a period of five years;

(b) expenditure on improvement of infrastructure in existing schools for children who are currently in school over a period of five years; and

(c) annual recurrent expenditure on salaries, textbooks, and other consumables for all children.

Box 2

Estimated Capital and Recurrent Costs for a Primary School for 150 Children with Five Teachers, West Bengal 1995 (in Rs)

Expenditure Head	*Cost (Rs)*
Capital Expenditure	
• Building	3,00,000
• Sanitary Provision and water	40,000
• Furniture and blackboards	35,000
Total capital expenditure	*3,75,000*
Unit capital cost	*2500*
• Mats, chalks, dusters	500
• Teaching aids, recreational materials, play materials, library facilities, teacher reference books, etc.	10,000
• Textbooks	10,000
• Teachers' salary (for 5 teachers)	1,54,740
• Cost of teachers' training	26,190
• Maintenance (10 per cent of capital expenditure)	37,500
Total Recurrent Expenditure (including maintenance)	*2,38,930*
Unit Recurrent Expenditure	*1593*

Source: Ramchandran, Rawal, and Swaminathan (1997), Table 8, p. 43 (based on information provided by the Office of the Minister, Primary and Secondary Education, Government of West Bengal).

Note: The statement from the office of the minister mentions that the costs involved in establishing a school, other than the cost of building, are same in rural and urban areas. As far as the building is concerned, a relatively cheaper option for urban areas is to hire buildings. This, the statement mentions, is a general practice in West Bengal. The rent for a building of five classrooms in West Bengal is about Rs 2500 per month.

TABLE 4.6

Investment Requirements for Five Years for Universal Schooling of Children in the Age Cohort 6–11

State	Yearly investment required for five years	Yearly investment as a proportion of SDP, 1995–6
Andhra Pradesh	21,366,699,817	3.32
Assam	7,886,790,323	5.07
Bihar	31,289,283,047	9.31
Gujarat	11,989,616,454	2.23
Haryana	5,277,066,616	2.15
Himachal Pradesh	1,398,085,116	2.84
Karnataka	13,378,251,553	2.96
Kerala	6,448,382,012	2.50
Madhya Pradesh	23,651,920,903	5.01
Maharashtra	22,609,506,733	1.69
Orissa	9,215,675,486	4.32
Punjab	5,635,839,319	1.59
Rajasthan	15,813,772,954	4.69
Tamil Nadu	14,029,928,412	2.43
Uttar Pradesh	47,289,959,146	5.34
West Bengal	21,454,171,438	3.47
India	281,299,256,920	2.85

Our major findings, from an updating of the RRS study, are the following.

- In India as a whole, 2.85 per cent of GDP (or Rs 281,299 million) should be spent on primary education as compared to current expenditures of around 1.5 per cent of GDP.
- High absolute levels of expenditure are required to school all 6–11-year-old children but there are variations across states. The annual expenditure requirements are very high in Bihar (Rs 31,289 million) and Uttar Pradesh (Rs 47,289 million). These are populous states with a poor enrolment record. Expenditure requirements are lower in absolute terms in Kerala, Himachal Pradesh, Punjab, and Haryana as these states are smaller and have higher levels of enrolment.
- In terms of total resource requirements in relation to SDP, a relatively low burden, of 1.5 per cent of SDP, is placed on states such as Punjab and Maharashtra as they have high incomes. About 2 to 3 per cent of SDP needs to be committed to primary education in Kerala, Himachal Pradesh, Tamil Nadu, Haryana, Karnataka, and Gujarat. In Andhra Pradesh and West Bengal, the government needs to spend 3 to 3.5 per cent of SDP on

Box 3

World Bank Estimates

The estimates of total costs in the World Bank study (World Bank, 1997) are based on estimates of the following three components: costs of maintaining the existing system, costs of expansion of the system, and costs of improving quality of the system.

- The costs of maintaining the existing system are estimated on the assumption that teacher salaries rise by 4 per cent annually; that 50 per cent of the children are provided textbooks worth Rs 40 per annum; and that 20 per cent of the children benefit from other incentives worth Rs 50 per student per annum. The costs of maintaining the existing system are estimated to increase from about Rs 79,886 million in 1996 to about 121,423 million in 2007 (at 1993 prices).
- The costs of expansion of the system include the costs of construction of 1.32 million classrooms; hiring of 739,000 teachers; textbooks worth Rs 40 per student per annum for 50 per cent of the children; and other incentives worth Rs 50 per student per annum for 30 per cent of the children. Expenditure for expansion of the coverage is estimated at about Rs 14,986 million in 1996, rising to about Rs 63,891 million in 2007.
- The costs of improving quality are based on the assumption that quality of existing schools would be improved by incurring expenditure to provide facilities currently available in schools participating in the District Primary Education Programme (DPEP). This requires rebuilding of 30 per cent of existing classrooms; provision of drinking water and sanitary facilities in 80 per cent of schools; costs of instruction material (Rs 2500 per classroom); and costs of teacher training (Rs 500 per teacher per year). The cost of providing this package is estimated at Rs 9762 billion in 1996 and Rs 11,341 billion in 2007.

Now, some important qualifications need to be made.

- First, the World Bank sets a target of twelve years for achievement of universal enrolment; we argue, given the long neglect of mass elementary education, that India should aim at achieving universal enrolment in a period of five years.
- Second, the World Bank has used data on school attendance from the Fifth All-India Education Survey. According to the World Bank, 32 million children in the age-group 6–10 years were out of school in 1995. According to our estimates, based on NSS data for 1993–4, 47 million children in the age group 6–11 years were out of school in 1995–6.
- Third, our computations are based on the assumption that one teacher is required for each class in a five-class school (for a school of 150 children this obviously means a teacher–pupil ratio of 1:30). The World Bank estimates allow for one classroom and one teacher per 40 children. It is not clear what size of school—in terms of number of students, number of classes, or number of classrooms—is assumed. The World Bank study does not explicitly state that there need be a classroom and a teacher for each class; the report only says that the teachers are to be recruited 'for these new classrooms'.
- Fourth, for new schools, the cost estimate is for construction of classrooms alone and there is no mention of providing other facilities like drinking water and sanitary provisions. It may be noted that the estimates for improvement of quality include investment in providing drinking water and sanitary provisions in 80 per cent of existing schools; the same investment does not seem to have been included in the cost of new schools.

We believe that provision of adequate minimum infrastructure—one classroom for each class, one teacher to teach each class, and facilities like drinking water and toilets—is a basic requisite for effective expansion of primary schooling and that any compromise on these would undermine the cause of universal elementary education. Similarly, provision of textbooks to all students, adequate provision of teaching aids and regular training of teachers are crucial for expanding the coverage of primary schooling. The World Bank estimates allow for provision of textbooks to only 50 per cent of students, teaching aids worth only Rs 2000 a year, and an annual pittance of Rs 500 on teacher training.

In short, our norms such as for the cost of construction of schools and of average salaries for teachers are lower than those used in the World Bank study. Even with lower salaries and unit costs of construction, we estimate a requirement of about 2.8 per cent of GDP for providing reasonable quality of schooling to all children. This can be viewed as a minimal estimate. If we use the teacher salary and cost of construction per classroom as assumed in the World Bank study, the resource requirements for universal primary schooling would be higher. Our estimate, however, is based on a snapshot of 1995 and does not take account of relative growth rates of education expenditures and GDP.

primary education. Not surprisingly, in Rajasthan, Uttar Pradesh, Orissa, Madhya Pradesh, and Assam, where current enrolment levels are low, more resources are required (4 to 5.5 per cent of SDP). The outlier is Bihar, a state with very low levels of enrolment and where SDP has fallen in the 1990s.

- In terms of additional resource requirements, that is resources for educating children currently out of school, only one state—predictably Kerala—has to spend very little. Additional resource requirements amount to 0.36 per cent of SDP in Kerala as compared to 1 per cent in Tamil Nadu, 2.4 per cent in Andhra Pradesh, and 4.5 per cent in Uttar Pradesh.

To sum up, about 2.85 per cent of GDP *would be required annually to provide adequate quantity and quality of primary schooling to all children within five years.* If we limit the calculation of expenditure requirements only to those currently not in school, then the additional expenditure required is of the order of 1.89 per cent of GDP. In sharp contrast, the Government of India estimated that an additional annual expenditure of 0.49 per cent of GDP over the next five years would suffice (cited in PROBE Team, 1999). The assumptions underlying the official estimate need to be carefully examined in further research.

Interestingly, the World Bank has recently estimated the costs of universal primary education in India (World Bank, 1997). According to the World Bank, no radical increase in expenditure is warranted and the present rate of growth of expenditure may be sufficient to create the infrastructure for universal elementary schooling by 2007. The financial commitment depends on the relative rates of increase of GDP and teacher salaries, the most important component of recurrent expenditure on education. It is thus argued that present rates of growth of expenditure on education would be sufficient if India achieves a 5 to 6 per cent annual growth of GDP between 1996 and 2007 and restrains the growth of teacher salaries to less than 4 per cent per annum. However, if national income and teacher salaries were both assumed to grow at the rate of 4 per cent per annum between 1996 and 2007, an expenditure of about 6 per cent of GDP on education would be sufficient. There is a further assumption that about 45 per cent of total education expenditures or 2.7 per cent of GDP are spent on elementary education. While the latter estimate appears to be close to our figure, there are problems with the World Bank methodology (see Box 3).

CONCLUSIONS

As we enter the twenty-first century, sending every child to school in India must become a priority for the state and for society. We have argued in this chapter that legislation for compulsory education can catalyse the process of universalizing school education, and the union government should take up the 83rd Constitutional Amendment Bill and make education a fundamental right. Second, the task of providing primary school education to all children requires stepping-up of expenditures on primary education. Contrary to the dictates of orthodox structural adjustment, public expenditure on education has to be raised. Our estimates indicate that a commitment of around 2.8 per cent of GDP is needed if this objective is to be taken seriously. In the National Policy on Education, 1986, announced by Rajiv Gandhi, the government promised to increase public spending on education to 6 per cent of GDP during the Eighth Plan. This promise must be fulfilled. Lastly, to attain the goal of universal primary education, legal compulsion and adequate public expenditure must be combined with social and political changes including changes in teacher and parent motivation.

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5

Air and Water Quality Management New Initiatives Needed

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INTRODUCTION

One of the indicators of quality of life is a clean environment. It can be further disaggregated in terms of air quality, water quality, noise levels, etc. Air in our cities has become highly polluted. Pollutant concentrations exceed limits considered safe by the World Health Organization (WHO) by large margins. Water in most of our rivers is not fit to drink and in many rivers not even fit to bathe in. Economic activities of production and consumption are accompanied by emissions and effluents of various by-products into the atmosphere. Natural processes absorb these within limits and air and water quality are restored. When these limits are exceeded, pollutants accumulate and air and water quality deteriorate.

How far have water and air quality deteriorated? What are the consequences? Why do they deteriorate? Who are the main polluters? What would it take to clean up our air and water? What are we doing to contain air and water pollution? Why do our efforts not work? What policies can be effective? These are the questions we address in this chapter.

AIR QUALITY SCENARIO IN THE COUNTRY

Urban Air Quality

India has twenty-three cities of over one million people, and ambient air pollution levels exceed WHO health standards in many of them. Urban air pollution is worsening due to upward trends in power consumption, industrialization, and vehicle use. Six of the ten largest cities in India—Mumbai, Calcutta, Delhi, Ahmedabad, Kanpur, and Nagpur—have severe air pollution problems, with annual average levels of suspended particulate matter (SPM) at least three times higher than WHO standards. In Delhi, Calcutta, and Kanpur annual average SPM values are over five times the standard. Nationwide, over 90 per cent of the monitoring stations in urban areas for which annual mean concentrations are reported by the Central Pollution Control Board (CPCB), exceeded 75 $\mu g/m^3$ of particulates—the midpoint of the WHO recommended standard.

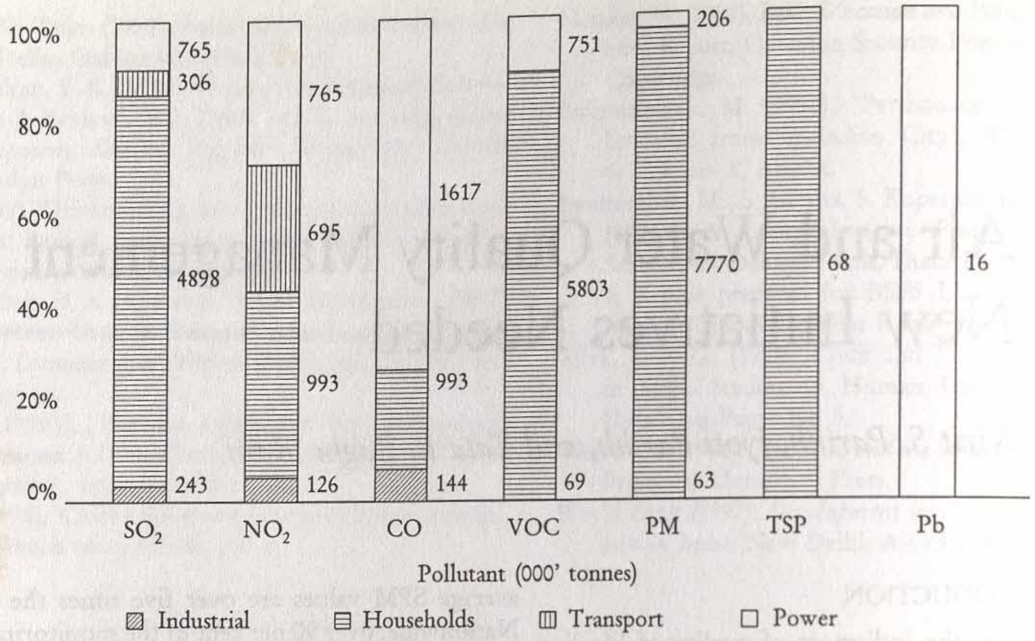
However, annual average concentrations of SO_2 and NOx are generally low in relation to typical ambient standards. There does not appear to be any clear correlation between a city's population and air pollution, and many small and medium sized cities such as Indore, Bhopal, and Dehra Dun have very high air pollution levels.

Indoor Air Quality

In India, indoor air pollution—particularly in rural householdes—has so far been neglected. It is recently estimated that 82 per cent of SO_2, 38 per cent of NO_2, 88 per cent of volatile organic compound, and 96 per cent of particulate matter emissions in the country come from the household sector (see Figure 5.1). In India these high concentrations arise because unprocessed biofuels such as cowdung, fuel wood, and crop residues are burnt within the kitchen. Mineral coal also causes such pollution in a few Indian households.

Impact of Air Pollution

Air pollution causes many health problems; impacts economic productivity, especially agricultural productivity; damages material property such as buildings and land; and causes ecological changes that increase the risks of environmental disasters. The flight schedules of airlines get routinely disrupted in winter due to smog in Delhi that leads to shutdown of the airport for want of visibility. In terms of health impact, total suspended particulates and PM10 (particles less than 10 microns in



Source: Parikh and Parikh, 1999

Figure 5.1 Air Emission Accounts for 1989–90

diameter, which more easily penetrate the lung and are therefore more relevant than total particulate matter for human health) have been associated with both premature mortality (death from respiratory illness and cardiovascular diseases) and increased morbidity (increased prevalence of chronic obstructive lung disease, especially bronchitis, and increased incidence of upper and lower respiratory tract infections). Ozone contributes to incidences of respiratory hospital admissions, restricted activity, asthma, eye irritation, and heart disease. Carbon monoxide (CO) reduces the amount of oxygen carried by the blood, but dissipates rapidly in the environment and the effects are reversible. High levels of atmospheric lead contribute to both hypertension and neurological damage, including intelligence quotient (IQ) loss, in children (Ostro, 1994).

As per a World Bank study (Brandon and Homman, 1995), ambient air pollution levels (PM10, SO_2, lead, and NOx) exceeding WHO standards in thirty-six major Indian cities/towns account for 40,350 premature deaths, 1,98,05000 thousand hospital admissions and sickness requiring medical treatment, and 1201 million incidences of minor sickness annually.

Parikh et al. (1994), estimated the cost of health damages due to air pollution in Mumbai. For every 10 Mg/cu. m increase in SO_2 concentration, the social costs could exceed Rs 100 million, which includes only dyspnea and mortality effects. The study also estimated cumulative loss in property value in Chembur for every 100 μg/cu. m increase in SPM concentration at Rs 200 million. Another case study (NEERI, 1998) estimated human health damages due to air pollution in the National Capital territory, Delhi, at Rs 1168 million per year (see Box 1). It is evident from these case studies that the country is paying a heavy price due to air pollution.

High exposure to indoor air pollutants has been shown to cause serious health problems like acute respiratory infections (ARI), chronic obstructive lung disease (COLD), lung cancer, and possibly tuberculosis (TB), blindness and heart disease (Mishra, Rutherford, and Smith, 1997; Smith, 1987). The silent sufferers are those who spend the most time indoors, viz. women, children under 5 years of age, and senior citizens. They are regularly and severely exposed. Therefore, a major portion of India's population is at risk (Box 2).

Who Pollutes Air?

Activities that cause air pollution are many. They include the use of fossil fuels, industrial processes, and burning of bio-fuels. Sectoral air pollution emission accounts for 1989–90 are estimated by the IGIDR (Parikh and Parikh, 1999) as presented in Figure 5.1. It is reported that emissions from the household sector (indoor air pollution) contributed substantially (82 per cent SO_2, 39 per cent NO_2, 19 per cent nitrous oxide, 88 per cent volatile organic compounds [VOC], and 97 per cent of particulate matter) to air pollution in the country. The transport sector contributed most of the pollution load (27 per cent NO_2, 74 per cent CO, 11 per cent VOC, and 100 per cent lead) in urban areas of the country.

BOX 1

Health Damages Due to Poor Air Quality in the Chembur Region of Mumbai

The private economic burden of dyspnea in Chembur due to poor air quality exceeds Rs 3.5 million, with another Rs 2 million possible by including other 'free' services like government hospitals and municipal services.

- For every 10 μg/cu. m. increase in SO_2 concentration, the social costs could exceed Rs 100 million, which include only dyspnea and mortality effects.
- The loss of rent, not including property values, in Chembur due to air pollution amounts to Rs 1 million per year.
- The cumulative loss in property value in Chembur due to each 100 unit increase in SPM concentration and each 100 unit increase in ammonia is around Rs 2000 million.
- Environmental quality is a factor in residential buying decisions, as reflected in real estate prices as well as residents' willingness to pay.

Another case study under the Capacity 21 project sought to apply economic valuation techniques to externalities of air pollution in the National Capital Territory, Delhi.

The major carbon monoxide and hydrocarbon emissions come from the transport sector. The power and industrial sectors contribute to SPM, S0x, and N0x emissions. Costs in health, vegetation, and material damages are valued. Costs in terms of loss in visibility are not measured. Abatement costs for minimizing these damages are estimated. The major findings are:

- Human health damage costs due to air pollution is 1168 million/year
- Vegetation production losses are valued at Rs 321 million/year
- Total avoidance cost to minimize these damages would be Rs 1699 million/year (143 million in the industrial sector, 75 million in the power sector, 804 million in the transportation sector, and 677 million in the domestic sector)

The study suggests possible pollution control strategies for each source. The mitigation options include controls through standards, cleaner fuels, improved technology and operations.

Sources: Parikh et al., 1994; NEERI, 1998.

India's vehicle population registered phenomenal growth in the last two and half decades—from mere 2.1 million registered vehicles in 1973 to 25.2 million registered vehicles in 1993 (Ministry of Surface Transport, 1993). Vehicular emission loads in 1994 are estimated at 3596.8 tonnes per day in twelve major Indian cities.

The Central Pollution Control Board (CPCB) identified a total of 1551 medium and large industrial units in the country under the seventeen highly polluting industrial sectors. Of these about 77 per cent are predominantly water polluting and 15 per cent are predominantly air polluting, and the remaining 8 per cent are both air and water polluting industries. Pollution load from the industrial sector in 1995 contributed 2 million metric tonnes of pollutants (Down To Earth, 1999). Some of the most air polluting industries are industrial chemicals, rubber, textiles, iron and steel, non-metal products, food products, paper, printing-publishing, metal products, and leather.

BOX 2

Health Impact of Indoor Air Pollution

- Silent sufferers are adult females, children below 5 years of age, and senior citizens.
- Significant health impact of bio-fuel smoke.
- 410,000—570,000 premature deaths per year seem to be caused by indoor air pollution.
- For each death, there are about 6 years of illness in the population.
- Efforts are urgently needed to investigate this problem more thoroughly and to promote clean stoves and clean fuels.

WATER RESOURCES

Major Problems

In India, utilizable water availability per capita per year is estimated at 1250 m^3 (CWC, 1999). Severe water shortages occur in many regions seasonally, particularly as a result of uneven distribution of water resources over time and space. Thus the main problem is inadequate availability of water where and when it is needed. Provision of clean drinking water to all is a major policy goal, which is yet to be realized. As of March 1993, 78 per cent of rural and 85 per cent of urban Indians had access to safe potable water. That still leaves some 200 million persons without safe drinking water. On the other hand, sanitation services are available to only 48 per cent of the urban and about 3 per cent of the rural population (Central Statistical Organisation, 1997).

In recent times, water quality has deteriorated due to rapid industrialization, population growth, and intensive agriculture as they generate increasing quantities of industrial wastewater, domestic wastewater, and agricultural run-off respectively. Water quality in most stretches of major rivers is below the CPCB prescribed best-use category. Critical parameters affecting water quality are high biochemical oxygen demand and total coliform. Pathogenic water pollution due to domestic and human waste is the cause of many water borne diseases. Water quality degradation is increasingly becoming a source of conflict among upstream and downstream users.

An estimated 80 per cent of people in the country use groundwater for their domestic needs (UNICEF, 1998). India's total replenishable groundwater resources are estimated at 431.8 km^3 (Central Statistical Organisation, 1997). Average level of groundwater development in India is 32 per cent. Some states (e.g. Punjab 94 per cent, Haryana 84 per cent, Tamil Nadu 60 per cent, Lakshadweep 64 per cent, Rajasthan 51 per cent) have exploited groundwater resources to a greater extent than some other states (e.g. Gujarat 41 per cent, UP 38 per cent, Andhra Pradesh 24 per cent, Bihar 19 per cent) (Central Statistical Organisation, 1997). Irrigation is using 90 per cent of the groundwater abstracted whereas domestic needs account for just 6 per cent of the total volume pumped. The third most important problem is the overexploitation of groundwater in many parts of the country. The other main concern is groundwater pollution due to leaching from surface sources like agricultural fields and waste dumps. The depths of the water table at which tube wells draw water are increasing and as a result inorganic pollutants such as fluoride and arsenic are leached out leading to chronic health hazards. As more water is pumped out from the fluoride and arsenic rich substratum, more of these pollutants are drawn above the ground. On ingestion, this leads to fluorosis and arsenic poisoning, as happened in West Bengal and Bangladesh.

The fourth important issue in water policy is that of land degradation due to inappropriate water use. Farmers at the head of a canal irrigate their crops intensively, use much more water then they are entitled to and often more than required by crops, causing water logging and salinity.

Many regions of India have adequate water resources, but as the quality is deteriorating, the supply of water with quality required for certain purposes is not available. Therefore conflicts over water availability and quality are growing. Taken for granted when supplies are plentiful, water is the focus of increasing controversy as supplies now appear to be inadequate to meet demands in many regions of the country. Incentives for wise and conservative use of the resource or for effecting efficient allocation among competing demands are not there.

Impact of Poor Water Quality

Several diseases like diarrhoea, hepatitis (jaundice), ascariasis (roundworm), hookworm infection, trachoma, and dracunculiasis (guinea worm) have been linked to human contact with polluted water. The World Bank and World Health Organization (World Bank, 1993) have estimated that in India, 21 per cent of all communicable diseases (11.5 per cent of all diseases) are water related. The specific diseases are diarrhoea, trachoma, intestinal worms, hepatitis, and the *tropical cluster* (schistosomiasis, leishmaniasis, lymphatic filariasis in India) of diseases. It is estimated that every year, 1.5 million children under 5 years die in India of water-related diseases and the country loses 1800 million person hours (over 200 million man days) each year due to these diseases (Ministry of Rural Development, 1993). A quantitative measure that integrates premature deaths and temporary disability due to diseases is disability adjusted life years (DALYs). About 30.5 million DALYs are lost each year in India due to poor water quality, sanitation, and hygiene as illustrated in Table 5.1.

Using the human capital approach, the statistical value of one DALY is equal to the annual average productivity of Indian workers (since one DALY implies one year in which a worker cannot work due to either sickness or premature death). If we take merely the economic value of a life year at the average per capita GDP of Rs 12,000 per person, the annual loss of 30.5 million DALYs is worth Rs 36,600 crore. Thus the country should be willing to spend that much annually to provide clean drinking water to all. Improvements in water supply and sanitation can substantially reduce the incidence and severity of these diseases, as well as the infant mortality associated with diarrhoea as shown in Box 3.

Who Pollutes Water

Freshwater quality is impacted directly by natural and human activities such as land use practices, erosion, and deforestation. Three major sources of water pollution are domestic wastewater, industrial wastewater, and agricultural run-off.

TABLE 5.1

Burden of Water-related Diseases in India, 1990

(in millions of DALYs)

Disease	Female	Male	Total
Diarrhoeal diseases	14.39	13.64	28.03
Intestinal helminths	1.00	1.06	2.06
Trachoma	0.07	0.04	0.11
Hepatitis	0.17	0.14	0.31
Total water-related diseases	15.63	14.88	30.51

Source: World Development Report, 1993, pp. 216–19.

Box 3

Improvements in Water Supply and Sanitation Can Substantially Reduce Incidence and Severity of Diseases

Reduction in morbidity from better water supply and sanitation is estimated to be 26 per cent for diarrhoea, 27 per cent for trachoma, 29 per cent for ascariasis, 77 per cent for schistosomiasis, and 78 per cent for dracunculiasis. Mean reduction in diarrhoea-specific mortality can be 65 per cent, while overall child mortality can be reduced by 55 per cent.

Source: Esrey et al., *1991*

Water pollution from domestic and human wastewater is most problematic and the cause of many severe water borne diseases. In India, the organic loading of the water bodies is enormous due to gross inadequacy of domestic sewage treatment plants in rural as well as urban areas. Domestic and municipal effluents are estimated to constitute 75 per cent of India's wastewater by volume (MOEF, 1992). Still wastewater treatment facilities in our cities/towns are grossly inadequate.

In 1988, class I cities generated 12,146 MLD (million litres per day) of wastewater whereas class II towns contributed 1298 MLD. Bombay (1714 MLD) and Delhi (1480 MLD) individually generated more wastewater in 1988 than 241 class II towns put together. Twenty per cent of all the wastewater generated in class I cities and only 2 per cent of that generated in class II towns was treated. Estimates of wastewater generated in the rural sector are not available, where only 3.15 per cent of the population had access to sanitation services in 1993 (Central Statistical Organisation, 1997). Put together, the receiving water bodies are under great stress.

Indian industry has registered substantial growth in the past four decades. Of the 2901 large water polluting industrial units discharging effluents into rivers and lakes, only 841 (29 per cent) have adequate effluent treatment plants (ETP), 2026 (69.8 per cent) do not have adequate treatment facilities, and the remaining 34 have been closed down (MOEF, 1997).

The green revolution ushered in by the development of high yielding varieties and associated development of water resources and application of agricultural chemicals has made India self-sufficient in foodgrains. But the negative impacts of use of agricultural chemicals, often indiscriminate, on water environment are now being felt. Fertilizer $(N+P_2O_5+K_2O)$ consumption has increased from 7.7 million tonnes in 1984 to 13.9 million tonnes of nutrients in 1995–6. Use of technical grade pesticides has increased from 24,305 tonnes in 1971 to 85,030 tonnes in 1994–5 (Central Statistical Organisation, 1997). Fertilizer run-off leads to nutrient enrichment in the receiving water bodies, resulting in eutrophication. Pesticides get accumulated in the food chain, with increasing concentrations along the food chain (biomagnification). This in turn affects various species in the food chain, including man.

WHY ARE AIR AND WATER NOT TREATED ADEQUATELY?

One time investment in setting up of pollution control devices, especially if the investment is small relative to revenue generated, is often made for the sake of 'compliance'. Monitoring agencies often verify the existence of the treatment plants and abatement devices. However, operating costs can be high depending on the constituents of air emissions and wastewater. Hence a firm may set up pollution control devices and not run them if the operating and maintenance costs are substantial. Devices are turned on when regulators visit the plant. This is due to the fact that dynamic monitoring (continuous monitoring of device effectiveness) demands adequate manpower and substantial financial resources, which are not available monitoring agencies.

It is also interesting to note the ownership regime pattern in water polluting industries. About 48 per cent of the total water polluting units are in the state public or cooperative sectors, and 9 per cent are in the central public sector. Thus more than half (57 per cent of the non-complying units belong to the public sector, while the remaining 43 per cent are in the private sector.

The large number of small-scale industrial facilities (including unorganized and household units) are not adequately addressed in the current pollution abatement policy. With regard to providing fiscal incentives, such as financial assistance for setting up common effluent treatment plants (CETPs) or for the adoption of clean technologies, the main problem is the lack of an initiating mechanism to induce firms to take advantage of these schemes. In the absence of strict enforcement of emission and discharge standards, there is no reason for polluting industries to voluntarily treat their emissions and effluents even with fiscal incentive schemes.

In the domestic sector, which contributes 75 per cent of effluents by volume, collection and treatment of wastewater are responsibilities of the municipal authority or the village panchayat. Absence of basic amenities like sewerage systems and sanitary services is the main reason for non-treatment of domestic sewage. Non-implementation of legal stipulations, lack of financial resources to provide these amenities, and in some cases lack of awareness all contribute to the problem.

In the agricultural sector, so far there are no restrictions on the use of fertilizers and pesticides. Awareness campaigns among farmers to promote integrated pest management practices, and introduction of environment friendly farm practices (vermiculture, biomanures) should be the future direction.

What Should the Level of Treatment be and at What Cost?

Currently, the emission and effluent standards prescribed by the CPCB are based on where the effluent is being released after treatment. Even if all the industries comply with the standards, the ambient air and water quality may deteriorate if there are many industries. Furthermore, there is no classification of pollutants based on their impact on the environment.

With increasing understanding of the limited waste assimilation capacity of the environment, environmental standards are getting stricter. In the transport sector, for one, vehicle emission standards are being made progressively more stringent since 1991. CO emission standards for petrol driven two wheelers would go down to 2 gm/km in 2000 from 12–30 gm/kg in 1990. Similarly, for diesel vehicles (less than 3.5 tonnes vehicles weight), CO standards would go down to 4.5 gm/kwh in 2000 from 14 gm/kwh in 1990.

From the progressive standards it seems that diesel cars not only benefit from cheap fuels but get pollution subsidy as the emission standards are not stringent enough. Diesel cars need to pay some amount of fuel tax as the petrol car pays over a year. In addition, diesel cars should also pay pollution tax. More stringent regulations also imply that waste treatment facilities have to become increasingly efficient. As a result the costs escalate steeply. For example, an effluent treatment plant of 99 per cent efficiency can cost almost twice as much as one of 90 per cent efficiency for certain critical pollutants such as colour or total dissolved solids (Modak, 1995). Industries in India may have to spend around 2-5 per cent of the capital investment of the industry for pollution control assuming satisfactory treatment and handling of effluents, emissions, and solid wastes. The costs of operating the facilities are anywhere between 15–30 per cent of the investment made on the treatment facilities, on an annual basis (Modak, 1995). The cost of emission and effluent treatment depends on the waste characteristics (volume, concentration, etc.), limiting standards for discharge, and the treatment technologies adopted. For example, the annualized costs of water pollution abatement in major water polluting industries in India range from 0.01 per cent (in cement) to 3.9 per cent (in chemical) of the annual turnover.

COST OF PROVIDING DRINKING WATER, SANITATION, AND WASTEWATER TREATMENT

Drinking Water

There are still many villages in the country without safe drinking water availability, which are called problem villages. A problem village is that where drinking water is not available within a radius of 1.6 km or, in hilly regions, within 100 m elevation difference. It was estimated that there were 161,722 villages with drinking-water-related problems in the country as on April 1985. As a consequence of the technology mission on drinking water initiated by Rajiv Gandhi, it was claimed that by April 1992 there were only 2958 problem villages in the country. But subsequent to a comprehensive survey (1991–4) undertaken for the Rajiv Gandhi National Drinking Water Mission the figures were revised to 1.41 lakh non-covered villages/habitations, 4.3 lakh partially covered villages/habitations, and 1.43 lakh villages/habitations with acute water quality problems. Recent data indicate that 3.38 lakh problem villages have been covered under rural water supply programmes during the Eighth Five Year Plan period (Planning Commission, 1997). It is proposed to provide safe drinking water to the remaining villages/habitations during the Ninth Five Year Plan with a proposed outlay of Rs 40, 000 crore for rural water supply (Planning Commission, 1997).

Sanitation

As per the 1991 census, there are 115.3 million housing units (14.3 million in urban and 101 million in rural areas) in the country without toilets of any type (Central Statistical Organisation, 1997). This means that 75.7 million people in urban areas (average residents per housing unit 5.3) and 563.6 million people in rural areas (average residents per housing unit 5.58) do not have access to toilets of any type. This leads to enormous fecal contamination, which is a major cause of many diseases. If we were to provide toilets (pour flush sanitary latrines) to each housing unit, it would cost approximately Rs 4000 per housing unit (at 1997 prices, as proposed in the Ninth Five Year Plan of Maharashtra state) and most of it should come from the stakeholder household. This would imply an expenditure of Rs 461,166 million to construct toilets in 115.3 million housing units in the country.

Providing sewerage systems to collect wastewater and feed it to treatment plants also needs huge investments. However, the costs of sewage systems vary considerably depending on geography, population spread, existing capacities, and wastewater generation. For example, under the Ganga Action Plan, an expenditure of Rs 1087 lakh was incurred for sewerage provision for Mirzapur city (population 1.61 lakh) (Khan, 1996). This implies an investment of Rs 640 per person or Rs 3400 per household at 1990 prices.

Wastewater Treatment in Urban Areas

As per the 1991 census, there are 3697 cities/towns in India with a total population of 215.33 million. Ten cities with a population of 1.5 million and more are selected for detailed analysis. The population in these ten cities by year 2001 would be 72.33 million (Central Statistical Organisation, 1997). By that year 5620 MLD of untreated wastewater is expected to be generated by these cities. Urgent measures are needed to equip these cities with adequate wastewater treatment facilities. Each city has to select an appropriate technology to treat wastewater discharges, based on wastewater characteristics and cost-effectiveness of the option.

Initial capital cost (exclusive of land cost) requirement to treat wastewater using four different technologies (activated sludge treatment plant [ASTP], oxidation ponds, aerated lagoons, and upward anaerobic sludge blanket [UASB]) is given in Table 5.2. Oxidation ponds and aerated lagoons appear to be least cost intensive but their land requirement is 3–5 times more than other technologies. This implies that availability and cost of land would determine selection or rejection of these options. Discussion on merits and demerits of these technologies is beyond the scope of this chapter.

We calculated capital investment needs for wastewater treatment in these ten cities with four different technology options. A combined initial capital investment of Rs 14,050 to 16,860 million and about 2810 acres of land are required to treat wastewater through ASTP technology in the ten cities. Though the capital investment needed is minimum (Rs 4215 million), the land requirement will be very high (14,050 acres) if the oxidation pond technology is opted for.

Going a step further, we estimated wastewater discharges from the remaining 3686 cities/towns (excluding the ten cities discussed earlier) in the country for year 2001. We assumed a hypothetical situation where the entire urban population would have access to water by 2001 as per minimum water supply norms suggested by the Rajiv Gandhi Drinking Water Mission. We also assumed that 80 per cent of water consumed would be discharged as wastewater.

Total wastewater generation from 3686 cities/towns is estimated at 23,615 MLD. In 1988, 20 per cent of all wastewater generated in class I cities and only 2 per cent of that generated in class II towns was treated; information on other size class towns was not available (CPCB, 1989). As recent data on wastewater treatment facilities in cities/towns are not available, we optimistically assumed that all size class cities/towns would have built treatment facilities to handle 20 per cent of their wastewater by 2001. It still leaves some 18,892 MLD of untreated wastewater by that year. To treat this through ASTP technology, an initial capital investment of Rs 47,230 to 56,676 million and 9445 acres of land are

TABLE 5.2
Costs of Domestic Wastewater Treatment

Technology	Land retirement	Capital cost
Activated sludge treatment plant (ASTP)	0.5 acres/mld	25–30 lakhs/mld
Oxidation ponds	2.5 acres/mld	7.5 lakhs/mld
Aerated lagons	1.5 acres/mld	15 lakhs/mld
Upward anaerobic sludge blanket (UASB)	0.5 acres/mld	16 lakhs/mld with post-treatment

Note: Capital cost is exclusive of land costs.
Source: MOEF as cited in Down To Earth (1997).

required. With UASB technology, the capital investment needed is Rs 30,227 million and land requirement is 9445 acres. Alternately, Rs 14,169 million as capital investment and 47,230 acres of land are required if oxidation pond technology is opted for.

Abatement Costs in Major Water Polluting Industries

Murty (1997) estimated total investment costs required for water pollution abatement in major water polluting industries in India. The study estimated capital stock required for water pollution abatement in Indian industry in a hypothetical situation where all polluting industries would comply with standards. The total capital stock is estimated at Rs 59,179 million. Assuming a discount rate of 15 per cent and lifetime of fifteen years gives a capital recovery factor of 0.171. Using this, annualized capital cost requirement for water pollution abatement in major water polluting industries is estimated. Total annualized capital cost required for water pollution abatement in major water polluting industries is Rs 10,120 million. Total annual investment needed for water pollution abatement across industries (inclusive of wage bill, material cost, and power cost) is estimated at Rs 14,089 million which is about 1.17 per cent of annual turnover of all water polluting industries.

Water Pollution Abatement Costs in Small-scale Industries

Misra (1998) estimated economies of scale in water pollution abatement activity at Nandesari industrial estate in Gujarat, comprising 250 small-scale factories. The study considered three alternate institutional arrangements for water pollution abatement at Nandesari, i.e. command and control, market-based instruments, and common effluent treatment. The cost of meeting State Pollution Control Board standards (command and control regime) is estimated at Rs 419 million. Market-based solutions, where hypothetical pollution permits are traded, would cost Rs 382 million. Cost of pollution abatement through a CETP, which consists of primary treatment (within the factory premises) followed by treatment at the CETP, is estimated at Rs 122 million. The study concludes that the market-based solution fails to take advantage of a common effluent treatment plant and hence is not as economical as the CETP arrangement. Potential benefits to six villages surrounding Nandesari and the urban city of Vadodara, from water pollution abatement activities at Nandesari industrial estate, have been estimated as Rs 330 million, using the contingent valuation method (Misra, 1997). The study clearly shows that the institutional arrangement of the CETP is necessary to internalize the water pollution externalities in the case of small-scale factories and that large potential welfare gains can be generated.

COST OF AIR POLLUTION CONTROL

The cost of controlling industrial air pollution is not large. Often, the solutions involve more efficient use of fuels which can save enough to pay for the efficiency measures. Imposing emission standards on new equipment can be effective for our capital stock may double in ten years if the economy grows at the rate of 7 per cent. More difficult is the control of air pollution generated by vehicles and household use of biofuels (see Box 4).

Urban air quality is deteriorating due to vehicular emissions. This is a cause for concern as the number of vehicles in urban areas is rapidly increasing. For example, in Delhi, vehicle population has increased

Box 4
Indoor Air Pollution

The indoor concentration of pollutants can be reduced by improved ventilation in the cooking area, better stoves which require less fuel and generate less smoke, and clean fuels for cooking. Improved biomass stoves and improving ventilation are likely to be the most cost-effective options for the near and mid-term. However, they only reduce pollution exposure but do not eliminate it in the long term. A more long-term option is transition to high quality liquid and gas fuels for cooking as in the urban areas and richer households in some villages. In general there is preference for cleaner fuels, and a transition to clean household fuels comes as a natural consequence of economic development. Such transition can be accelerated if clean fuels are made readily available and cheaper. These clean fuels can be both renewable and non-renewable types such as bio-gas, solar stoves, kerosene, liquid petroleum gas (LPG), or electricity.

However, these fuels are not easily accessible either due to supply constraint or a number of problems involved in their use. Promotion of kerosene and LPG is the best long-term solution, and as LPG is still only an urban cooking fuel, kerosene is the next preferred fuel in the household sector in rural areas.

from 2.35 lakh in 1975 to 26.29 lakh in 1996. The number is expected to touch 46 lakh in 2004 and 60 lakh by 2011 (MOEF, 1998). It is observed in this study that two-thirds of the vehicles in Delhi are two-wheelers, operated on two-stroke engines, and account for 70 per cent of hydrocarbon and 50 per cent of carbon monoxide emissions. Annualized avoidance costs for vehicular pollution control in the National Capital Territory, Delhi, using catalytic converter technology, are estimated as Rs 804 million at 1995 prices (NEERI, 1998). The study also suggested that air pollution loads could be substantially reduced by proper interventions in the transport sector. Cost effectiveness of alternate vehicular pollution control under three different scenarios is also estimated as shown in Table 5.3.

TABLE 5.3
Cost Effectiveness of Alternate Vehicle Pollution Control Scenarios

Scenario	% Reduction in air pollution load			Cost
	HC	CO	NOx	(Rs million)
Scenario I	21	18	33	4200
Scenario II	23	23	33	4600
Scenario III	35	57	36	15,318

Scenario I

- 25,000 pre-1984 cars to be phased out
- Three-wheelers to be replaced by cars/fitted with four stroke engines
- 12,352 pre-1984 buses to be replaced

Scenario II

In addition to scenario I

- All cars to be fitted with catalytic converters

Scenario III

In addition to scenarios I&II

- Indigenous catalytic converters for leaded gasoline vehicles
- Indigenous particulate diesel traps/filters for diesel vehicles
- Fuel efficient engines

POLLUTION MANAGEMENT POLICIES IN INDIA

Government initiatives for air and water pollution management are outlined in the National Water Policy, 1987; National Conservation Strategy and Policy Statement on Environment and Development, 1992; and Policy Statement for Abatement of Pollution, 1992. The strategy and policy statements prescribe command and control, technological measures, zoning, fiscal incentives, and use of economic instruments as mechanisms for air and water pollution control. Major air and water pollution management policy statements are outlined in Box 5. The present approach to control pollution in India is to use regulatory instruments along with systems for monitoring the prescribed standards to achieve the government's policy goals. Thus standards for ambient and point source emissions/discharges are set by various acts of the government. Compliance is mandatory and provisions for penalties are made in the acts. These are monitored by the Central and State Pollution Control Boards. A legal framework and occasionally fiscal incentive schemes for implementation and compliance of the standards support the regulatory approach.

Legislative Initiatives for Air and Water Pollution Control

The last two decades have witnessed a spate of governmental legislation creating environmental laws to protect environmental resources and the interests of the general public. The important air- /water-related environmental laws, regulatory and promotion measures enacted by the Government of India are: the Water (Prevention and Control of Pollution) Act, 1974; Water (Prevention and Control of Pollution) Cess Act, 1977; Air (Prevention and Control of Pollution) Act, 1981; Environment (Protection) Act, 1986; Public Liability Insurance Act, 1991; Environmental Impact Assessment (1994); environmental audits and ambient air/water quality and effluent standards.

The Water Act (1974) has resulted in the creation of the Central and State Pollution Control Boards with the aim of prevention, abatement, and control of water pollution, later expanded to control air pollution too. The Water Cess Act, 1977, and the Air Act, 1981, provide for imposition of a levy on water consumed by certain industries and by local authorities and to collect consent fees from polluting industries. The main aim of this levy is to increase the resources of the Central and State Pollution Control Boards for the prevention and control of water pollution. The Environmental (Protection) Act, 1986, empowers the central government to decide emission standards, restrict industrial sites, lay down procedures and safeguards for accident prevention and handling of hazardous waste, conduct investigations and research on pollution issues and on-site inspections, establish laboratories and collect and disseminate of information. The environmental impact assessment (EIA) introduced in 1994, empowers the central government to impose restrictions and prohibitions on the expansion and/or modernization of any

Box 5

Major Air and Water Pollution Management Policy Statements of the Government of India

Technological Measures

- Use of clean fuels and clean technologies, energy efficient devices, air and water pollution control systems
- Incentives for environmentally benign substitutes, technologies, and energy conservation
- Internalizing environmental safeguards as an integral component of the total project cost

Zoning Strategy

- Setting up of source specific and area-wise air/water quality standards and time bound plans to prevent and control pollution
- Proper location of projects to minimize adverse impact on people and environment
- Raising of green belts with pollution tolerant species
- Priority to compatible industries so that, to the extent possible, wastes from one could be used as raw material for the other, thus minimizing net pollution
- Location of industries as per environmental guidelines for siting of industry

Fiscal Incentives and Economic Instruments

- Incentives for environmentally clean technologies, recycling and reuse of wastes, and conservation of natural resources
- Operationalization of 'polluter pays principle' by introducing effluent/emission tax and resource cess for industry, and implementation of standards based on resource consumption and production capacity
- Public liability insurance against loss or injury to life or property
- Internalizing environmental safeguards as an integral component of the total project cost

Command and Control

- Enforcement of pollution control norms in various types of industrial units depending on their production processes/technologies and pollution potential; particular attention to be paid to highly polluting industries
- Introduction of 'environmental audit'
- Environmental impact assessment from the planning stage and selection of sites for location of industries
- Clearance by the MOEF of all projects above certain size and in fragile areas

Source: MOEF (1992b).

activity or new project unless an environmental clearance is granted. Projects must submit an EIA and an environmental management plan. Depending on the type or size of industry, the MOEF or state governments have assessing jurisdiction. It is mandatory for all major polluting industries to submit annual environmental audits to the concerned pollution board. The basic aim here is to make industries accountable and self-monitoring, thus reducing burden on pollution boards. The ambient and emission/effluent standards are set by the CPCB. Standards are site and receptor specific (industrial, urban, residential, ecologically sensitive zones, etc.). State boards can impose stricter standards. The emission/effluent standards are sector specific and are dependent on best available pollution control technology. Under the Public Liability Insurance Act it is mandatory for business owners operating with hazardous waste to take out insurance policies to compensate persons injured by accident.

Fiscal Incentives for Air and Water Pollution Control

In additions to legal provisions, the government also provides fiscal incentives to industries for pollution control. Some of the fiscal incentives currently available to industry for pollution reduction are depreciation allowance, rebate in water cess, concessional custom and excise duties, and soft loans from financial institutions.

These instruments, unfortunately, do not provide the necessary incentives to polluters for choosing the least cost methods for pollution control. So far there are no serious attempts to use economic instruments such as pollution taxes or marketable pollution permits, which provide incentives to the polluters for adopting least cost pollution abatement technologies. Another anomaly widespread subsidies by the Government of India (on fertilizers, agricultural water and electricity use, and domestic water supply), that encourage excessive use, leading to adverse impacts both on quality and quantity of water.

HOW TO IMPROVE AIR AND WATER QUALITY

The very poor quality of air and water in many parts of the country suggests that these policies have not worked too well. The reasons for this failure are obvious: legislation which is not or cannot be implemented, and is ineffective. Over the last two decades the pollution control boards have initiated thousands of cases against polluting industries but have obtained only a handful of convictions. For example, in Rajasthan only two convictions have been obtained in nearly 7000 cases. The pollution control boards are poorly staffed, lack technical facilities to measure and monitor, have meagre financial resources, and are subject to political pressures.

Box 6

Pollution Management through Social Pressures
Indonesia's PROPER Programme and Application to India

In Indonesia, it was observed that environmental performance of a firm depends on where it is located and the socio-economic status of the region. BADEPAL (the Indonesian Environmental Impact Management Agency) came up with an innovative programme called PROPER to encourage factories to reduce pollution. The PROPER programme proposed a five colour rating system for grading firms. Compliance levels were subdivided into gold, green, blue, red, and black ratings, in decreasing order of level of compliance, gold being the best and black the worst. The ratings were published. The colour rating system met several objectives. First, by collapsing complex data into a single rating, the system made it possible to compare the water pollution performance of very different firms. Second, the final ratings were simple and their implications easily understood. The idea behind the new programme was simple: by providing information about pollution in a form that non-specialists could understand, the initiative sought to tap the growing power of the media and public opinion to promote cleaner industry.

The first partial announcement of results, in June 1995, was given heavy media coverage. Five factories were awarded the green rating (no factories were rated gold). Of the remaining 182 plants, only the distribution of the colour ratings was disclosed: 61 were blue, 115 red, and 6 black. BAPEDAL gave plants rated red or black until December 1995 to improve their performance before their names and ratings were publicly disclosed. Under the threat of public disclosure, ten factories managed to improve their rating to red or blue within six months. Conversations with plant owners and other evidence suggest that the primary force driving these improvements was concern about potentially strong negative responses from local communities and markets. In December 1995, full disclosure got under way. Disclosure included plants' colour ratings, names and locations, managers and parent companies. A fresh round of ratings, announced in September 1996, revealed additional improvements.

The movement of firms from non-compliance to compliance was remarkable. In June 1995, 65 per cent of factories were rated red or black. By September 1996, non-compliant firms accounted for just 47 per cent of the total. Moreover, the number of firms in compliance increased by 50 per cent in this period.

The new approach to pollution regulation in Indonesia showed that local communities, the media, and market forces could be powerful allies in the struggle against industrial pollution. Encouraged by the results BAPEDAL is planning to rate 2000 plants by the year 2000. Several other countries like the Philippines, Colombia, and Mexico have also launched similar programmes. PROPER has mainly been applied to large enterprises. However, it remains to be seen whether small and medium sized enterprises, which are not very well known to the public, can also be included in this programme. Besides the environmental performance was much worse in poorer communities. Does this mean that PROPER was likely to work better in affluent and well-educated parts of Indonesia? Also, will BAPEDAL be able to sustain PROPER's effectiveness once the programme's novelty wears off and the media move on to other stories?

How can this idea be tried in India? Can we use financial markets to sustain long-term interest in environmental performance by requiring that the firms report their environmental risks to their shareholders? After all, delay of a project and even closures on environmental grounds are definitely possible and affect a firm's profitability. This would require periodic environmental audits which may be done by chartered environmental auditors (CEA) (on the lines of chartered accountants). Guidelines, manuals, and training programmes will be needed for certified environmental auditors.

The colour rating agency and pollution control board (PCB) complement each other. The PCB has the technical competence and administrative authority. Unfortunately, it is locked in legal battles and does not work through societal pressures as rating agencies can. The two agencies can serve as watchdogs on each other, giving competition and confirmation to their findings. Can we link the colourrating scheme to environmental audits, which should be mandatory?

For pollution control in the industrial sector, the present policy relies on industry-specific emission/effluent standards, based on best available technology. Naturally, industries do not reveal what is possible and manage to obtain lax standards. In case of water pollution, the cess levied is on the volume of water and not on concentration of pollutants in the effluent. This also does not give incentive to reduce pollutant concentrations. An appropriate policy would be to measure the quantity of pollutants and levy tax at a rate that rises with quantity. This will provide industries incentives to do what they can to clean up their emissions/effluents. Such a simple economic solution is objected to on the grounds that it requires effective measurement and monitoring. However, our experience has shown that in the absence of such monitoring even our present policy is ineffective, as the pollution control boards are unable to obtain many convictions in the courts. So we must have effective measurement and monitoring of all major polluting firms. Once we have them, we might as well use the economically more efficient pollution tax.

Experience of industrialized countries has also shown that firms react to popular pressure. To generate such pressure, citizens should be given the right to information. Effluent quality measurements of all firms should be publicly available so that citizens could know who is damaging their air and water and by how much. Environmental quality management through social pressures has succeeded in countries like Indonesia (See Box 6).

To improve water quality in our rivers, besides taking care of pollution by large polluting firms, we need to take care of effluents by small polluting firms and municipal sewage often dumped untreated into our water bodies. Small firms will have to be relocated together where a CETP is required for them. Municipal sewage must be treated. There is no alternative. The cost of poor quality water on the population is so large that sewage treatment is economically justified. Municipalities and corporations must be required to do so.

To reduce water pollution from agriculture, use of chemicals has to be curtailed. Appropriate pricing would encourage more effective use of chemicals. But new technologies also have a role to play here. Integrated pest management practices should be vigorously encouraged. Special markets can be created for eco-friendly farm products. To reduce fertilizer use and resultant nutrient run-off, environment friendly practices like vermiculture and use of biomanures should be encouraged. Fertilizers may be delivered through drip irrigation to minimize water use and fertilizer use, and promote effective crop management.

Finally, special measures are needed to control vehicular emissions in urban areas. It has been demonstrated that through proper interventions in the transport sector, overall pollution levels can be substantially reduced. Some of the measures are urgently needed, to cut pollution levels with immediate effect and some are long-term measures as shown in Box 7.

Box 7

Vehicular Pollution Management Measures

Immediate Measures

- Phase out old vehicles from urban areas
- Introduce catalytic converters for vehicles
- Introduce unleaded petrol in all urban areas
- Effective monitoring of vehicle emissions
- Tax vehicles for differential pollution

Long-term Measures

- Introduce four-stroke engines (for fuel efficiency and low emissions)
- Improve fuel quality
- Improve public transport systems in urban areas
- Improve road quality for smoother flow of traffic
- Set strict emission standards for new vehicles

Air and water pollution impose enormous burden on people's health. The costs of cleaning up air and water are comparatively small. Clean air and water are not a luxury, they are a necessity. With sensible policies, right to information, citizen awareness, and a lot of investment, we should and must clean up our air and water.

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6 Urban Transport

R. Ramanathan

INTRODUCTION

As is the trend worldwide, India is undergoing rapid urbanization. This means not only that more people than ever before will be living and working in cities, but also that more people and more goods will be making more trips in urban areas, often over longer distances. How Indian cities meet this burgeoning demand for urban travel has implications for the environment, the economic efficiency, and the liveability of these areas.

Urban vehicular growth closely follows the trend of urbanization. Motor vehicles offer undeniable advantages such as speed and convenience; indeed during the early stages of development of a city, motor vehicles are vital to economic growth. However, the costs of increasing dependence on cars in the world's cities are becoming all too apparent. These include expensive road building and maintenance; clogged, congested streets that undermine economic productivity; high levels of energy consumption along with its economic and environmental costs; worsening air and noise pollution; traffic accidents; and social inequities that arise when the poor find transportation services increasingly unaffordable.

In this chapter, an attempt is made to take a closer look at the development of urban transport in India. The pattern of increase of transport in Indian cities has so far encouraged the growth of personalized vehicles, which is not viable in the long term especially from energy, environmental, and sustainability points of view. We discuss some of the efforts proposed and carried out by the authorities to overcome the problems, and suggest some steps for further action.

URBANIZATION IN INDIA

India has witnessed tremendous growth in urbanization since Independence. Urban population has increased from 62.4 million in 1951 to 217.2 million in 1991, nearly 3.5 times. In 1991, urban population accounted for 25.7 per cent of total population. It has approximately doubled in two decades (say 1961–81 or 1971–91). There were 296 class I cities (forming just 8.2 per cent of total towns of all classes) accommodating 65.2 per cent of urban population in 1991. Just twenty-three metropolitan cities (with a population of one million and above) had more than 50 per cent of the population of class I cities. Table 6.1 shows the trends in the evolution of metropolitan cities in India.

TABLE 6.1

Trends in the Growth of Metropolitan Cities in India

	No. of metropolitan cities	Average population in millions	Share (%) of population of metropolitan cities in total population	Share (%) of population of metropolitan cities in urban population
1951	5	2.35	3.25	18.81
1961	7	2.59	4.12	22.93
1971	9	3.09	5.08	25.51
1981	12	3.51	6.16	26.41
1991	23	3.07	8.37	32.54

Source: Census of India, 1991.

Most of the smaller metropolitan cities have been registering higher population growth. Bhopal has registered the highest growth—its population in 1991 was more than ten times its population in 1951.

According to a study made by the Government of India, there will be 83 cities in India by 2001 with a population of 0.25 million (according to the 1991 census, India had 93 cities with population above 0.2 million and 73 cities with population above 0.3 million). Travel demand in these cities will be 443 billion PKM. Nearly 80 per cent of this demand is expected to be met by road-based transport systems (MoUD, 1987).

Such rapid urbanization has several energy implications, including problems due to transport, energy consumption, pollution, congestion, waste generation, and slums (Linden, 1996; CSE, 1998). This chapter focuses on transport-related problems. The importance of urban transport can be gauged by the sheer magnitude of the annual loss inflicted by poor traffic and transportation in urban India, which is estimated to be of the order of Rs 200 billion.

PATTERNS OF GROWTH OF URBAN TRANSPORT IN INDIA

Urbanization has close linkages with the patterns of vehicular growth. In the affluent societies of the developed countries, increased urbanization has increased the number of cars, while the cities of developing countries are witnessing tremendous growth in the number of two and three wheeler vehicles as city size increases. India is no exception to this trend.

It has been observed that the growth rate of vehicles in Indian cities has increased with the size of the city (Ramanathan, 1998). This observation can be further supported if the trend of vehicular population is plotted with respect to city size (measured in terms of population). Figure 6.1 plots this[1] for different years. It indicates that the number of vehicles in a city is likely to grow approximately along an S-shaped logistic pattern as city size increases. Note that the trend is more pronounced in the 1990s than in the 1980s. Smaller cities obviously have a smaller number of vehicles. But as city size increases, the number of vehicles tends to grow slowly until the city reaches a certain critical size. This happens when the existing transport network and vehicles are enough to meet the demands of the economic activities in these cities. The general income levels of people in these cities are also not high enough to enable greater investment in personalized transport. Once the critical size is reached, the city enters a rapid phase and there is sudden and rapid rise in the number of vehicles. This rapid growth may be attributed to the level of economic activity in the city. The increased economic activities raise the income levels of people, allowing them to invest more in personalized travel. Also, increased economic activities demand larger mobility of passenger and freight, and larger additions to transport infrastructure and equipment. However, growth of vehicles tends to reduce beyond another critical level. This can happen when infrastructural bottlenecks tend to limit economic activities and insufficient road infrastructure discourages personalized travel in large mega cities. However, when additional infrastructure for transport is provided in these large cities, economic activities and hence vehicular growth will continue to increase at a higher rate. For example, Mumbai has registered negative growth in the number of vehicles in 1994, which may reverse once proposed flyovers and elevated driveways are completed.

Note that the approximate logistic pattern has occurred in the 1980s also, though it is less pronounced than in the 1990s. Also note that the slope of the rapid phase increases with time; the curve has a flatter rapid phase in the 1980s than in the 1990s. The critical levels at both ends of the rapid phase have also varied with time. The rapid phase in the 1980s started at higher city sizes compared to that for the 1990s. This may be because of the higher growth of the economy in the 1990s, which required much higher levels of mobility in cities. However, because of the sudden rise in the number of vehicles, infrastructure bottlenecks have forced the upper critical city size of the rapid phase to be reached much earlier in the 1990s than in the 1980s.

This S-shaped logistic pattern of growth of vehicles in urban India has important implications for formulating proper policies for urban transport. A number of towns in India are urbanizing rapidly (Ramanathan, 1998). Many of them will enter the rapid phase in the near future, and a very high level of vehicular growth can thus be expected.

Note that the logistic pattern can be altered by policy formulations. For example, if a city is developed to encourage walking and cycling by providing all the facilities within a smaller geographical area, the growth of motorized vehicles may be reduced. Many cities expand because people settle in the cheaper periphery regions of the city, and prefer to travel to work. This can happen so long as travel is relatively inexpensive compared to land. However, if travel is made more expensive, the horizontal growth of the geography of

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[1] Vehicular population represents the population as on 31 March. Note that the graph for the year 1996 is different from those of the previous years. The reason is the non-availability of data for some cities such as Hyderabad and Calcutta. Data pertaining to Delhi has been excluded as the number of vehicles in Delhi is much higher than the number in other cities, and hence is considered an outlier.

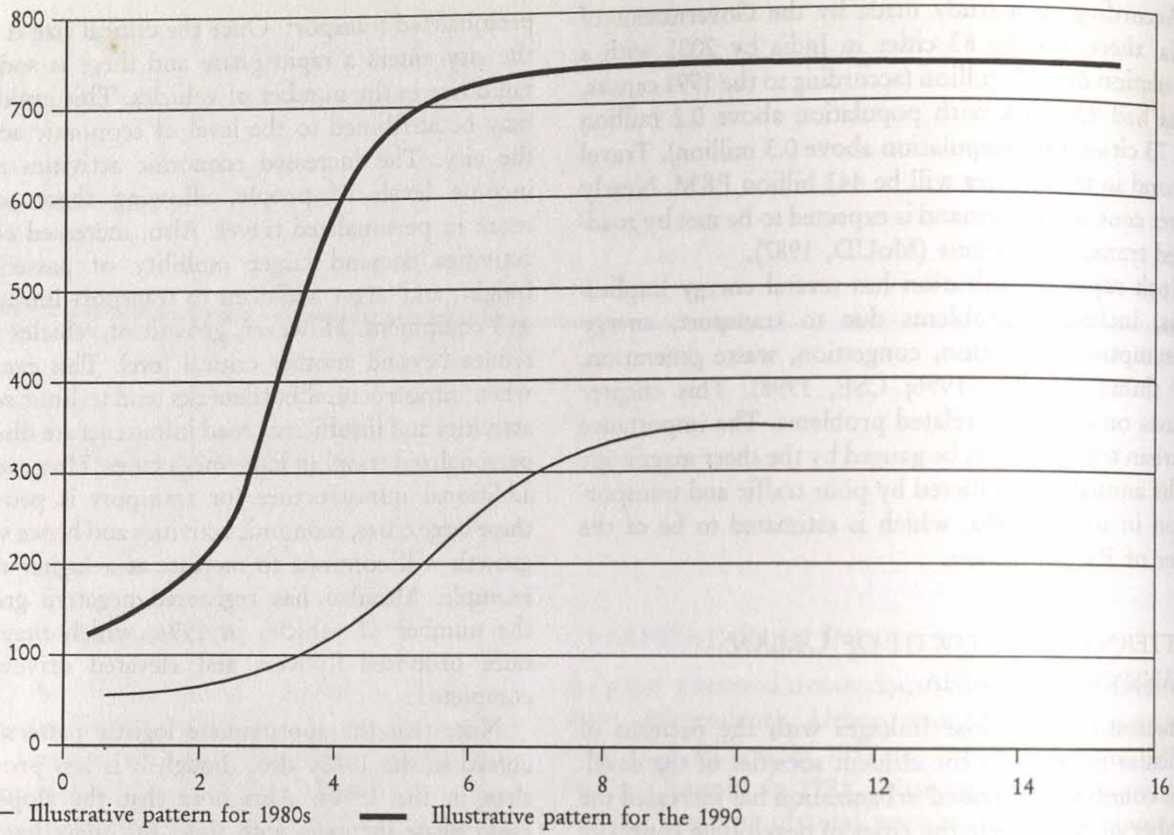

Figure 6.1 Variation of Vehicular Population with City Size (excluding Delhi data)

cities will be arrested and consequently there will be lesser travel.

Uneven Growth of Private and Public Transport

The composition of personalized vehicles in Indian cities is very high, and their growth has been much higher than that of public transport. In the four major metro cities, they form nearly 83 per cent (two-wheelers 52 per cent and cars 31 per cent) of the total number of vehicles. Public buses formed only 30 per cent of the total number of buses in 1991–2 (declining from about 46 per cent in 1980–1). State Transport Undertakings operating bus transport systems have recorded losses for the past few years. The share of public transport buses in the total number of vehicles went down drastically to just 1.9 per cent in 1989–90 from 11.5 per cent in 1960–2. In contrast, personalized and intermediate passenger transport vehicles (taxis and autorickshaws) have increased considerably in these metropolises and other lower order towns.

The share of mass transport modes in total trips in Delhi, Mumbai, Calcutta, Chennai, and Bangalore was 63 per cent, 67 per cent, 54 per cent, 55 per cent, and 70 per cent respectively in the late 1980s or early 1990s. In Lucknow, cycling and walking accounted for 55 per cent of the total trips (Habitat, 1994; CSE, 1996).

ISSUES ASSOCIATED WITH URBAN TRANSPORTATION TRENDS

The disproportionate growth of personalized vehicles in Indian cities has several implications: severe road congestion, reduction in speed, increase in accidents, increased energy consumption, and emission of local and global pollutants.

Insufficient Road Infrastructure

The share of urban roads in total roads in India has declined significantly, from about 8 per cent in 1971 to just about 6 per cent in 1996. In contrast, urban areas have always had more than 20 per cent of the total population, and metropolitan cities alone (which constituted just 7.7 per cent of the total number of Class I cities in 1991 or 0.65 per cent of the total number of all towns of all classes) account for more than 33 per cent of total motor vehicles. This highlights the gross inadequacy of the supply of urban roads to meet growing user demands.

This inadequacy of the urban road network has been compounded by a rapid increase in the number of vehicles, most of which will ply on urban roads. The delicensing of the auto industry in 1991 has fuelled unparalleled growth in the passenger car segment. About twenty-two projects involving total investment of more than Rs 20,000 crore have been committed in this sector so far. Of these, 8 projects of Rs 7500 crore are completed and 14 others are in various stages of implementation. Those completed have a collective capacity to manufacture around 300,000 cars. The annual sale of all vehicles, which was around 3 million in 1994–5, is expected to nearly double to 5.7 million in 2000–1. Most of these vehicles will occupy urban roads and add to existing congestion, unless sufficient road networks are planned and made available.

While no time series data are available to identify transportation changes with urbanization, certain trends can be observed with the cross-sectional data on mobility and congestion indicators for selected cities (Table 6.2). With the exception of Chennai, a general reduction in per capita road length is observed as city size increases. With a few exceptions, there is a general decrease in the ratio of road length to area as city size increases. There is also a general increase in the passenger car units (PCUs) and an increase in number of PCUs per km of road length as the city grows. These indicate that improvements in road structure have not been in tune with the growth of vehicles. The situation was much worse in the 1990s than in the 1980s. PCU per 1000 population has increased by more than 2.5 times in Delhi, Mumbai, and Calcutta. Delhi has recorded the highest increase. Per capita road length has decreased. More importantly, the number of vehicles per km of road has tremendously increased, with Delhi registering nearly five-fold increase.

Congestion

The most visible evidence of the deteriorating urban transport system in India is the rising number of traffic jams and the discomfort of suburban train travel. This may indirectly lead to a decline in the overall economic productivity of cities.

The rapid growth of personalized transport in Indian cities gives rise to serious congestions problems. A study has estimated that an increase in the share of bus travel from 57 per cent to 80 per cent in big Indian cities will lead to 54 per cent reduction in the number of vehicles on road (MoUD, 1987).

TABLE 6.2

Mobility and Congestion Indicators for Selected Cities

Cities	1988 population in millions	Road length in kms	Area in sq. kms	PCU[a] ('000)	PCU per 1000 population	Road length per million people (km)	Road length (km) per 100 sq. km	Transport area as % total area	PCUs per km of road	Trip length (km)
Calcutta	9.19	840	568.0	205.9	224	91	148	6.4	245	5.8
Mumbai	8.24	1423	438.0	318.6	387	173	325	NA	224	10.8
Delhi	5.73	1595	446.3	508.8	888	278	357	NA	319	13.4
Chennai	4.29	1670	572.0	91.9	214	389	292	17.0	55	7.6
Ahmedabad	2.55	906	93.0	106.7	419	356	974	5.6	118	7.3
Bangalore	2.92	1200	174.7	225.9	773	411	687	17.0[c]	188	10.6
Kanpur	1.64	962	299.0	107.5	656	587	322	4.1	112	5.7
Pune	1.69	521	138.9	149.0	884	309	375	11.6	286	7.9
Jaipur	1.02	247	206.1	179.3[b]	1767	243	120	12.1	726	NA
Thane	0.65	96	147.8	NA	NA	148	65	NA	NA	NA
Coimbatore	0.75	410	105.6	100.1	1335	547	388	NA	244	9.8
1990–1 data for three metros										
Delhi	8.62	1595	591	2312	268	185	357	NA	1450	NA
Mumbai	11.13	1426	603	809	73	128	326	20[d]	567	NA
Calcutta	11.83	840	1295	704	60	71	148	6.4	838	NA

Notes: [a] PCU (passenger car unit) is a measure of the car equivalent of space occupied by a vehicle while on road. The equivalences are: car = 1 PCU; bus = 3 PCU; two wheeler = 0.5 PCU; three-wheeler = 0.75 PCU.

[b] 1985 data.

[c] Habitat (1994) puts the value as 27 per cent for 1991.

[d] for 1991, as per Habitat (1994).

Source: Based on data available in Patankar (1991), Habitat (1994), CSE (1996), and miscellaneous sources.

The average speed of vehicles has also decreased in Indian cities. For example, in Mumbai, the average speed of vehicles was about 38 kmph in 1962, which has decreased to about 26 kmph in 1979, and further to about 15–20 kmph in 1993–4. The average speed in Calcutta was about 17 kmph in 1963, which has gone down to about 14 kmph in 1994. Average speed in Delhi was only about 15 kmph in 1993–4.

The congestion problem in many cities is compounded by the fact that there is no lane for slow moving vehicles and animals.

Energy and Environmental Issues

Rapid growth of personalized transport is very unsustainable and results in avoidable energy consumption and pollution. Because of rapid passenger transport growth in Delhi, its petrol consumption is estimated to have increased by more than 5.5 times between 1990–1 and 2000–1. Similar trends are expected in the other metropolitan cities as well (CSE, 1996).

Energy consumption has direct linkages with the emission of air pollutants. In the three metropolitan cities, the share of automobiles in total pollutant emissions is quite high. According to the World Resources Report (1996–7), motor vehicles were responsible for 90 per cent of the carbon monoxide (CO) emissions, 85 per cent of hydrocarbon emissions, 59 per cent of nitrogen oxide (NOx) emissions, 13 per cent of sulphur dioxide (SO_2) emissions, and 37 per cent of suspended particulate matter (SPM) emissions in Delhi during 1987. According to the same study, automobiles caused about 52 per cent of the total NOx emissions, 5 per cent SO_2 emissions, and 24 per cent of SPM emissions in Mumbai in 1992. In the year 1993–4, the share of automobiles in total pollutant load was as high as 64 per cent in Delhi and 52 per cent in Mumbai. The share was 30 per cent 'in Calcutta in 1988–9'. The contribution of automobiles to atmospheric concentrations of air pollutants is very significant. Measurements indicate that while SO_2 levels in the metros are generally within prescribed limits, the concentrations of nitrogen oxides and SPM are well above limits (Table 6.3). Another study (Opinion survey, 1998) conducted by the Union Environment Ministry in Delhi puts SPM concentration between 362–452 micrograms per cubic metre on an average day. The study paints a very bleak picture of the environmental conditions of Delhi, measured in terms of water quality of the Yamuna river, noise pollution, and total pollution load. For example, Delhi's average noise level is 75–85 decibels compared to the limits of 45–75 decibels. The study also shows that the total pollution load in Delhi is rising very rapidly, from 1450 tonnes per day (tpd) in 1991 to 2890 tpd in 1995.

TABLE 6.3

Average Annual Emissions Compared to National and International Standards, 1993

(values in micrograms per cubic metre)

City	SO_2	NO_x	SPM
Delhi	33	46	543
Mumbai[a]	23	205[b]	159[c]
Calcutta	62	39	394
National Ambient Air Quality Standards			
– Residential areas	60	60	140
– Industrial areas	80	80	360
– WHO standards	50	100	75

Notes: [a] At Mumbai Chatrapati Shivaji Terminus, in 1998.

[b] NOx levels.

[c] Respirable Suspended Particles (RSP).

Source: Based on data from CSE (1996) and other miscellaneous sources.

This trend should be checked. It is important to promote mass transport modes that are energy efficient and environmentally benign. For example, in India, buses consume, on an average, about 0.212 MJ of direct fuel energy (equivalent to about 6 ml of diesel) per passenger kilometre. Diesel and electric tractions of railways consume about 0.241 (about 7 ml of diesel) and 0.115 (about one-thirtieth of a unit—kwh) MJ per passenger kilometre respectively. These are quite small compared to the energy consumption of personalized transport modes, which averages about 0.532 MJ (equivalent to about 16 ml of petrol) per passenger kilometre (Ramanathan and Parikh, 1996). Thus huge savings in direct fuel consumption can be effected if traffic from personalized modes is diverted to mass transport modes. This diversion can also be environmentally benign. As fuel consumption can be directly related to the emission of carbon dioxide, significant reductions in transport-related emission of global pollutants could be achieved.

It has been estimated that an increase in the share of bus travel from 57 per cent to 80 per cent in big Indian cities will lead to a saving of 1.1 million tonnes of oil and a 36 per cent reduction in air pollution, with 27 per cent reduction in CO_2 emissions (MoUD, 1987).

Accidents and Casualties

In 1993–4, there were 2.86 lakh accidents on Indian roads, resulting in 2.88 lakh injured persons and 60,595 casualties. The largest twelve metropolitan cities accounted for 44,653 accidents (16 per cent), 36,888 injuries (13 per cent), and 5197 casualties (8.6 per cent). There seems to be no direct relation between accident statistics and vehicular or population density. This may be attributed to the slow vehicular speed in urban areas.

According to an international study (*Reader's Digest*, October 1998), in Asia Indian drivers are ranked second among traffic offenders, just after China. Although India has only about the same number of vehicles as Thailand and Taiwan combined, the country accounts for more than 10 per cent of the world's traffic fatalities each year.

STEPS AHEAD: KEY POLICY SUGGESTIONS

Several options are available for improving urban transport in India. We can learn from the experiences of cities around the world. First of all, it is necessary to plan well in advance. Use of any single option in isolation will not solve the problem, and integrated use of all these options is essential. For example, a policy to reduce the number of private vehicles will have detrimental effects on the economic growth of a city unless an efficient public transport system is made available. The public transportation system can function efficiently only when it is integrated well with the land use patterns. Similarly, larger investment in public transport modes without controlling the growth of personal vehicles will encourage avoidable and luxurious travel, and hence can lead to unsustainable transport performance—large transport costs, more congestion, pollution, etc. More importantly, the commitment of the implementing authority in effectively implementing the options is a very crucial factor in deciding the success of these options.

For efficient management, both the demand and supply sides of transport should be considered. They are discussed below.

Travel Demand Management (TDM) Measures

Integrated Planning of Public Transport and Urban Land Use

Growth of transport in a city and its land use patterns are highly interlinked. Hence it is possible to affect transport demand favourably by adjusting land use patterns judiciously. An integrated approach towards land use and transportation can increase the accessibility of jobs, shops, and other facilities without increasing the need to travel long distances (May and Roberts, 1995). Several cities across the world have successfully adopted such an integrated strategy (see Boxes 1 and 2), and it is possible to learn from their experiences.

Integration of land use with the development of public transport is vital for the relatively small, but rapidly growing urban centres of India. We have seen that there are several second level cities with a population of more than one million, and that vehiclular population in these cities is increasing at a high rate. We have further seen that the growth of road network is not in tune with the growth of vehicles in many Indian cities. Some of these second level cities (e.g. Coimbatore) are the fastest growing in India, and they have the potential to become large metropolises in future. Hence it is essential that a long-term plan for all round development of these cities is prepared and implemented immediately.

Normally, cities grow in a concentric fashion. As the city grows, the city centre (central business district or CBD) will become more and more important, and new areas will be annexed along the periphery. This causes flow of traffic from the periphery to CBD, which will increase as the city grows, causing congestion. In the absence of an efficient mass transport system, the traffic will be dominated by personalized vehicles, thereby compounding the problems of congestion.

Instead, if the development of the city is planned in such a way that business and commercial activities are not concentrated in the CBD but in locations along predecided structural axes, then these problems can be avoided. For example, if the city is developed in a circular fashion with inner and outer ring roads with many crossroads connecting them at regular intervals, and if business activities are established at specified locations along these ring roads, traffic will not always flow towards the centre of the city, but also to the periphery on the ring roads. Similarly, for linear cities, development can be planned along major parallel linear roads, with adequate crossroads connecting them at regular intervals. Business establishments may be planned along these major roads. This will cause equitable distribution of traffic along the structural axes, reducing congestion problems. The choice of locations for commercial activities should be decided such that the mass transportation systems can reach these places quite efficiently, thereby avoiding the necessity of private vehicles.

Recently integrated transport, land use, and air quality strategies for sustainable urban transport development have received much attention (Rebelo, 1996). Problems with air quality are especially severe in urban areas. Capturing the travel of private vehicle users by public transport can help improve air quality as well. Strategies for pollution control in transport such as efficiency improvements and alternative fuel technologies (especially electric vehicles) can be usefully integrated with public transport and land use. Some of these options are discussed later in this chapter.

Pricing and Taxes

Countries worldwide adopt a policy of subsidizing the costs of urban transport with the assumption that increased mobility can stimulate economic growth and

Box 1

Curitiba:An Example of Efficient Integration of Land Use and Public Transport

Curitiba, the capital of Parana state in south-eastern Brazil, can provide a good example of sustainability and exemplary urban planning. It is one of the fastest growing cities in a nation of urban booms. Its population growth was dramatic, from 300,000 in 1950 to 2.1 million in 1990. It was also transformed from an agricultural centre to an industrial and commercial powerhouse during this period. Such developments are likely to cause several urban-related problems, including congestion and environmental decay. But Curitiba defied the conventional wisdom and adapted to the transformation in a human friendly way.

The most important unifying feature of Curitiba's success is its emphasis on an integrated approach to the public transportation system, land use legislation, and the hierarchy of the road network. The key concept was to channel the city's physical expansion away from the central city and along five pre-determined linear corridors. Each corridor is built around a central or structural road that has exclusive lanes for express buses, for local traffic, for high-speed car traffic flowing in and out of the city. Municipal government acquires land along and close to the newly developed corridors, prior to their construction, and organizes construction of high-density housing programmes at these places. Zoning laws encourage high-density commercial development along these transport corridors, while land away from the corridors is zoned at low densities. On sites located along the corridors, buildings are permitted to have a total floor area of up to six times the plot size. The coefficient decreases as distance of the site from public transport increases. This has encouraged new commercial development outside the central city along the corridors and ensured public transport to high density residential and commercial areas. These developments in turn have greatly reduced traffic congestion and noise in the CBD, which is meant mainly for pedestrians.

There is also a hierarchy of roads. Each road is assigned a function in relation to its location and importance. First, there are five structural roads or corridors. There are 'priority' links connecting traffic to the structural roads. 'Collector' streets have commercial activity along them with all forms of traffic. 'Connector' streets link the structural corridors to the industrial city.

Along the corridors, a central lane was set aside for buses only. New bus lines were created and expanded as the city grew. A series of circular inter-district bus routes has been developed since 1979 to complement the express bus ways. Buses are colour coded: express buses are red, inter-district buses are green, and conventional (feeder) buses are yellow. There is full integration among the three sets of buses for facilitating easy transfer. There are large bus terminals at the end of each of the corridors, where people can transfer to inter-district, feeder, or inter-municipal buses. One single fare is valid for all buses within Curitiba. Smaller bus terminals are located approximately every 2 km along the express routes.

The express bus system is designed to facilitate rapid boarding. Bus stops have an innovative 'boarding tubes' concept with raised platforms at the same height as bus floors. The design cuts boarding and deboarding times. An express bus system with these boarding tubes is estimated to take three times as many passengers per hour as a conventional bus operating in a normal street. Tickets can be bought at the boarding tubes, thus eliminating the need for a crew on the bus to collect fares, which frees up space for more passengers. Another bus design, the bi-articulated bus with a capacity of 270 passengers, has five lateral doors for passenger entry or exit. Automatic fare collection, articulated buses, and traffic lights that give priority to buses allow the optimization of the system's operation and low operating costs.

The public transport system is operated by ten private companies and governed and regulated by a mixed capital company created by the municipal government. Companies are paid according to the length of the routes they serve rather than the number of passengers they carry, giving the city a strong inventive to provide service that increases ridership. The efficient public transport has attracted more than a quarter of Curitiba's automobile owners. This has obviously saved a lot of fuel energy.

In addition to tackling transport problems with low cost technologies, Curitiba has much to offer by way of solving the needs of rapidly growing cities. For the innovative low cost ideas adapted by Curitiba in waste management, sanitation, housing, historic preservation, social development, environmental education, etc. one should refer to more detailed articles such as Rabinovitch and Leitmann (1996).

The most important component of the success of Curitiba can be said to have been strong leadership which promoted a flexible attitude among city officials and strong public participation. The key man behind the success has been Jaime Lerner, who served as mayor for three different five-year periods between 1970 and 1992.

Source: Rabinovitch (1993), Rabinovitch and Leitmann (1996), and O'Meara (1998).

Box 2

Singapore's Land Transport Policy

Singapore is one of the few major cities in the world that is able to maintain smooth traffic flow within the city area at any time of day. The keys to Singapore's success in urban transport management lie in its good planning, coordinated multi-prong approach, and strong political and institutional commitment.

Road space occupies 10 per cent of Singapore's land. Further road expansion had to be limited because of space. Hence a comprehensive approach was adopted based on the principle of increasing road network capacity while containing road traffic and optimizing road use. Singapore's land transport policy is built on four main pillars.

1. Increasing road capacity, using a network of roads, expressways, tunnels, junction interchanges, flyovers, and underpasses. Traffic junctions are fully computerized.
2. Integrated land use planning to bring schools, factories, offices, shops, and recreational and other facilities into or near housing estates to minimize the need to travel far or frequently for work and other activities.
3. Promoting public transport (buses and the urban rail or MRT) by providing adequate infrastructure such as bus stops, MRT stations, and bus interchanges. Special lanes are designated for exclusive use by buses during peak hours. Special cards can be used in both buses and MRT stations.
4. Managing vehicle ownership and use in order to control congestion. Earlier, the government has tried to curb rising vehicle ownership through fiscal disincentives such as very high registration fees, road tax, and parking charges. These measure had limited success. A Vehicle Quota System (VQS) was introduced in 1990 to control the growth of vehicles directly by setting a quota on the number of new vehicles allowed on the roads. The quota ensures that vehicular growth is commensurate with gains in the carrying capacity of the road network. Under the VQS, a vehicle can only be registered with a Certificate of Entitlement (CoE), which is obtained through monthly tenders. A CoE is valid for ten years only, and needs to be renewed thereafter. An Area Licensing Scheme (ALS) has been in place to limit traffic entering the CBD, which requires vehicles entering the CBD to pay a licence fee. The ALS scheme has recently been replaced by Electronic Road Pricing (ERP) to allow charges to be fine-tuned depending upon the congestion level. A 'Weekend Car' scheme allows more people to use private cars during off-peak hours on working days and on Sundays and public holidays.

Source: Fwa (1997) and Shen (1993).

generate additional income. This subsidized transport has, however, its own adverse impacts. As a result of this subsidy policy, the direct cost that an individual incurs for his travel is usually only a part of the total cost of transportation. There are many costs that may not be adequately paid by the individual transport user, but are paid by some others or by the government. For example, increased transport usage requires increased investment by the government on transport infrastructure (such as roads) and traffic regulation. But these costs are not fully recovered by the government from transport users. These costs can be termed external costs or externalities. Some externalities may not be explicitly priced at all. Such non-market costs include costs due to accidents, environmental degradation, land use impacts, and social inequity (Litman, 1998; Button, 1990).

It is important to estimate the full costs of transportation because it helps evaluate the effects of growing transportation demand on future plans and their sustainability. Several studies on full costs of transportation in cities worldwide have estimated that the actual costs a road user pays for his travel are only a fraction of the overall cost that he imposes on the government and society (Litman, 1998; Zegras, 1998; Delucchi, 1997). Unsustainable rapid growth of transport can be checked only when the transport user is made to fully pay the costs. Taxes and fees are the conventional methods by which costs can be recovered from users. Road pricing can also be employed as a means of charging for road use. Car ownership may be restrained by increasing the costs of owning a car through registration fees and appropriate taxes. A vehicle quota system can also be used to restrict the growing number of vehicles in Indian cities. When road users are made to pay the full expenses of their travel, uneconomical and avoidable travel is likely to be eliminated, and trips a traveller makes will tend to spread across longer periods of day. These improvements could lead to a reduction in congestion, an increase in the use of mass transportation systems, and may also affect land use favourably.

PRICING: Pricing involves charging transport users so that part of the external costs of their travel are internalized. A variety of techniques can be used for the purpose—tolls, area licensing schemes, and electronic road pricing. Theoretically, an efficient road pricing scheme should cover all important roads of a city and should employ differential pricing in accordance with the demand for road use (Newbury, 1990). For example, just like telephone rates in India, higher prices should be charged for periods of maximum demand, namely the peak rush hours of morning and evening. The goal is to encourage people to use public transport modes instead of private vehicles or to drive during off-peak periods. However, owing to technical, administrative, and political complications, such theoretically efficient schemes are seldom implemented.

In India, road pricing as a means of generating revenue has received active consideration ever since private participation has been encouraged for road construction. Now, the principle is being applied to state-owned roads as well. For example, the Maharashtra government is charging a toll on vehicles using the Vashi bridge to enter Mumbai. It is planning to charge a toll for using the Mumbai–Pune expressway. In addition, more than fifty flyovers are being constructed at various locations in Mumbai, and to generate sufficient resources the government has decided to levy a toll on motorists entering the city.

TAXES AND FEES: These can be another means of charging the full costs of transportation. However, there is already an array of taxes on vehicles and fuels (especially gasoline). Taxes are levied on vehicle manufacturers also. One can also think of levying an exclusive tax on car finance companies, as they are partly responsible for increasing the number of vehicles on the road. These taxes are supposed to be used for the improvement of transport systems—construction and maintenance of roads, subsidizing public transport, etc. However, in India, there seems to be no mechanism for earmarking the tax revenue generated from vehicles and fuels exclusively for road maintenance activities. As a result, improvements in transport infrastructure are not in line with large revenues generated in this sector. A good beginning in this direction has been made in the budget for 1999–2000, which introduced a cess of one rupee per litre of diesel and earmarked half of the revenue for the National Highway Development Fund.

Fuel taxes can also be employed as a policy option to change travel behaviour. Economists estimate the price elasticity of gasoline demand which indicates the change in gasoline demand (for personalized travel) for a given change in fuel (gasoline) prices. Unfortunately, such elasticities are often low indicating relative inelastic behaviour. For example, gasoline price elasiticity for India ranges between –0.2 to –0.4 (Ramanathan, 1999), indicating that if gasoline prices in India are increased by 100 per cent, gasoline demand will decrease by only 20 to 40 per cent. Also, imposing duty on fuel uniformly throughout the country is very crude, as it makes no sense to penalize a rural motorist driving along empty country roads when the problem lies in cities and on congested roads. In this sense, road pricing, adjusted for place and time, is a better alternative as it can focus on the exact problem location.

In addition, pollution cess may be levied from polluting modes of transport to cover the costs of pollution abatement. As stated earlier, private transport modes cause substantially more pollution in India. Hence a pollution tax may be imposed on their use, and a part of the revenue generated may be transferred to subsidize the environmentally benign mass transport systems.

PARKING CONTROLS: It is possible to discourage private car usage by providing parking restrictions. If the price of parking is high, or parking is limited, then people tend to prefer car pooling or mass transport modes. However, these restrictions require an efficient public transportation system as an alternative. By providing a parking facility on the periphery of the CBD and providing adequate public transport to move inside the CBD, a significant amount of congestion in the CBD area can be avoided. Vehicles desirous of entering into the CBD should be made to pay a hefty fee for the use of the road as well as for parking.

ENTRY BARRIERS: Simply creating additional infrastructure such as roads or flyovers cannot solve the traffic problems of many of the cities. It is necessary to restrict the flow of traffic into the city. Unlike pricing and taxes, it is also possible to physically stop the entry of vehicles in the most congested areas of a city. Several cities worldwide have tried various forms of restricting the entry of vehicles. Box 3 provides some forms of entry barriers practised in different cities across the globe. It is important to note here that while entry barriers adopted in some cities were successful, there were unexpected results in some cities. For example, in Mexico city, when entry restrictions were limited according to number plates, many households bought a second car or switched licence plates to meet their mobility needs. In Athens, the number of households with two cars increased and motorists who were not allowed to enter the city drove around the city to get to their destination, thus increasing the length of their trips while also increasing emissions. In addition, the second cars newly bought were often second hand ones, which tend to be more polluting. Similarly, restrictions on the entry of low occupancy cars into the CBD will encourage car pooling, but will have detrimental effect on the economic activities of the city if an efficient mass transportation system is not developed as an alternative. These experiences only mean that any TDM measure should not be used in isolation to solve traffic problems, and there should be an integrated policy, of which several TDM measures are part.

Techniques such as the Area Licensing Scheme (ALS) practised in Singapore can be adapted to restrict the inflow of traffic in CBD areas of Indian cities. This scheme can be designed to facilitate easy implementation. This can be low cost and can be made labour oriented, too. Every car entering the CBD should hand over a pre-bought coupon to the collector(s) at the entrance. The coupons should be available in the open market. To reduce delay in purchasing coupons at the entrance, they may be priced at a higher level when bought at the entrance. The coupons may also be considered as tradable permits, which can be traded in the market. There may be a few minutes delay at the entry point, but this can avoid greater delay during commuting in the CBD. More sophisticated systems may be installed in due course which can reduce waiting time at the entrance.

Other Measures

Several additional strategies are possible for controlling travel demand. If working hours are staggered, peak-hour rush will decrease. Telecommuting should be used as far as possible to substitute for actual travel. Other measures can be used whenever and wherever possible to control traffic.

Box 3

Strategies Adopted in Cities around the World for Restricting Car Entry into the CBD

City	*Entry barrier*
Athens, Mexico city, Santiago	Car entry into city limited according to number plates.
Curitiba	CBD area is mainly meant for pedestrians (see Box 1).
Portland	Conversion of a section of downtown road into an urban park, limit on downtown parking spaces, road construction projects scrapped in favour of new transit lines.
Singapore	Vehicle quota system, heavy fees for getting a certificate of entitlement for owning a car, downtown entry fee, and heavy fuel levies (see Box 2).
Leicester, Vienna, Cologne, Strasbourg, Amsterdam, Turin	Cars are banned entry into city centres.
Several Dutch Cities	*'Woonerf'* concept for traffic calming. Cars are forced to navigate slowly around carefully placed trees and other landscapes. Cycling and walking have priority over automobiles.
Goteberg	The city centre is divided into five pie-shaped zones, all accessible by a ring road on the periphery. Automobiles are not allowed to cross the zone boundaries, while public transport, bicycles, and mopeds may.
Geneva, Copenhagen	Car parking is prohibited at workplaces in the central city. Bicycle parking places are increased.
Munich	Creation of 85,000 sq m auto-free pedestrian zone, easily accessible by public transport.
Hanover	The number of streets on which cars are allowed has been reduced, thereby offering better facilities for pedestrians and cyclists.
Freiburg	Subsidized monthly rail passes.
Washington, D.C. metro area, San Francisco, Honolulu	Carpoolers are provided special 'high occupancy vehicle' lanes.

Source: Lowe (1991), CSE (1996), and World Resources Report (1996).

Increasing and Improving Transportation Supply

There is vast scope for improving the insufficient and improperly maintained transportation infrastructure in Indian cities. Roads in Indian cities suffer from deficient sidewalks, crosswalks, bridges at railway crossings, etc. Roads are poorly surfaced and improperly maintained leading to safety hazards, congestion, increased fuel consumption, and pollution. Life spans of vehicles plying on these poor quality roads decrease, leading to more expenditure on maintenance. It has been pointed out in the *India Development Report 1997* that the cost of properly maintaining roads is only a fraction of the economic losses inflicted by bad roads (Ramanathan, 1997). In addition, in spite of using several TDM measures to eliminate avoidable travel, growing cities need increased mobility over the next several years to meet the demands of their economic activities. Hence strategies for increasing and improving transportation supply are essential for the growth of Indian cities. A sustainable transportation supply strategy for Indian cities should place greater reliance on environmentally friendly mass transport modes and less on private transport modes.

Promoting Mass Transport

Mass transport systems can move more people while occupying less road space. With the high occupancy rates of mass transport systems in India (they operate at super saturated capacity during peak periods), they are also very economical in terms of energy consumption and pollution for every passenger kilometre effected (Ramanathan and Parikh, 1999). At the Indian average occupancy of 1.6 per car and about 50 people per bus, a substantial saving (of more than ten times in terms of PCU) is possible if a bus can replace cars. Obviously, such substitution can help tremendously in easing congestion on roads.

However, forcing such a shift requires sustained effort from the public transport authorities and the co-operation of the government and commuters. Buses should be made punctual, comfortable, fast, and reliable. For faster movement of vehicles, roads should have separate lanes for express buses (inter-state and inter-district), mofussil buses (inter-city), city buses (intra-city), trucks, cars, and other personalized vehicles. Exclusive lanes for bicycles and adequate footpaths should also be provided. As far as possible, commuters should be able to travel on any of these buses with a single ticket. To make public transportation more attractive and punctual, buses should be given preference at signals and in traffic congestion.

There are plans to improve transportation supply in many Indian cities. Metros are planned in Delhi and Mumbai, to be built with the help of international funding agencies (such as the Overseas Economic Co-operation Fund of Japan for Delhi). The Mumbai Urban Transport Project (MUTP) II is being negotiated with international funding agencies. A mass rapid transport system has been planned for Delhi. In addition, an elevated light rail transit system for Bangalore and LRT/MRT project for Jaipur are under consideration for inclusion in the Ninth Five Year Plan. The Maharashtra State Road Development Corporation is building over fifty flyovers and two main elevated driveways in Mumbai. These will certainly help in meeting the growing needs of the economic activities of these cities by easing traffic snarls and opening several arterial passages. However, there is danger of uncontrolled, manifold increase in the number of vehicles in the city unless proper vehicle control measures are taken. The flyovers should be designed such that they have large exclusive bus lanes, and buses should get priority in congestion and at signals. In addition, separate lanes may be planned for bicycles. The likely rapid vehicular growth should be arrested by using proper auto-restraining policies (see Box 3).

To maintain economic efficiency, a few companies (more than one) may be formed for operating the public transportation system to encourage competition. The companies should be made autonomous and allowed to price their services on economic principles. To win away sizeable commuter traffic from private cars, fast and luxury bus services should be provided at a reasonable price. Services of differentiated quality may also be offered at a range of prices to suit the needs of different categories of commuters. Such efforts are being made by some bus operators in Indian cities. For example, luxury air-conditioned bus services have recently been introduced in Mumbai on selected routes. Of late, the smart card system for automatic deduction of fare has also been introduced. These cards can potentially be multi-application cards in the future—for travelling in buses, trains, taxis, etc.

An integrated public transport system should be planned such that the commuters can buy a single ticket for travelling by different classes of buses and suburban rail, if there is one. This can also reduce the fare for commuters due to telescopic pricing. The time wasted at ticket counters can be minimized. Those who own a ticket should be given preference to enter the bus to avoid delays. Innovative bus designs, such as wide doors and closing doors, can improve the quality of bus service.

There is tremendous scope for generating additional revenue by exploiting the commercial potential of mass transit points (bus stations and railway terminals). These are places which people frequently visit and there is vast scope for building shopping complexes at such points. Multi-storeyed buildings can be constructed in which the first few floors can be used for mass transit purposes, while the remaining may be used for commercial purposes. This will also facilitate commuters as they can combine their work and shopping trips. The arrangements will increase the car population near the mass transit points, but they should be charged appropriate parking fees, which can be used to subsidize part of the mass transit operations.

Promoting Walking and Cycling

Cycling and walking as modes of transportation have been receiving little priority in Indian cities. Unlike poor African countries, owning bicycles is within the reach of an average household, especially in urban areas. In fact, India is emerging as a major exporter of bicycles in the world market. But a cyclist in India is made to share the road with high speed automobiles and hence cycling is unsafe. The automobile friendly urban roads in Indian cities are not safe for pedestrians either. Traffic problems are often caused as pedestrians step off pavements occupied by hawkers and illegally extended shops. Sometimes, municipality decreases the footpaths. All these problems have resulted in increased accidents and fatalities.

As seen earlier, there is an increase in automobiles in a city as its economic activity increases. More people tend to switch to automobiles from bicycles and walking as their incomes increase. However, if properly promoted and encouraged, bicycles and walking can be efficient alternatives to automobile use (Gardner, 1998). In fact, bicycles can be relatively easily incorporated if an integrated transport–land use–air quality strategy is followed for the development of smaller but rapidly growing urban centres of India.

Most of the places in the CBD areas in cities (and any particular locality in the suburbs) can be reached by bicycles within a reasonable period of time. Constructing exclusive cycle lanes and according high priority to bicycles on the road may encourage the use of bicycles. Bicycles should be given preference in parking within the CBD area, near public transport stations, and near suburban railway terminals. Exclusive signals for bicycles may be installed. A separate bicycle path may be constructed at railway level crossings (just like the bridges for pedestrians). Facilities may be created in local trains and public transport buses to house bicycles, so that people can use them in conjunction with the mass transport modes. Similar promotional arrangements can be considered to encourage walking.

Reducing Vehicle Pollution

An integrated strategy for sustainable urban transport development should not only consider improving public transport for optimal land use and controlling the growth of private vehicles, but also urban air quality. Several options are possible. Use of unleaded petrol which eliminates harmful lead emissions can be promoted. Efficiency of existing vehicles can be increased. Cleaner and low polluting fuels can be used. New low emission technologies can be promoted.

Engines may be designed such that they consume less fuel for moving the same distance. Technology changes such as conversion from two-stroke to four-stroke engines can effect significant savings in terms of both energy consumption and environmental emissions. Owing to these advantages, several two-wheeler manufacturers in India have to switch to four begun stroke technology. Progressively stricter pollution control norms are also ensuring the adoption of such environmentally benign technologies. It has been estimated that efficiency improvements in Indian vehicles can save as much as 26 per cent of energy consumption, and equivalent reductions are possible in environmental emissions (Ramanathan and Parikh, 1999).

Introduction of alternate transportation fuels can also reduce energy requirements and emissions. Compressed natural gas (CNG), bio-ethanol, and methanol are the other possible fuels for transportation. Of these, the most relevant for India is CNG (Painuly and Parikh, 1993). CNG vehicles are more efficient and cleaner than their gasoline counterparts. In addition, pressure for cleaner environment especially in urban areas is expected to stimulate the introduction of electric vehicles in India. Analysis has revealed that, under normal diffusion levels of the new technologies, they may not provide much advantage in terms of energy consumption and emission reduction (Ramanathan and Parikh, 1999). However, introduction of alternate fuel vehicles can be especially beneficial in urban areas. They have the potential to reduce the emissions of carbon monoxide, nitrogen oxides, particulates, etc. Also, the diffusion of these vehicles can be smooth if they are concentrated in urban areas, where the necessary infrastructure (such as CNG pumping stations, battery charging stations, etc.) can be provided relatively easily and efficiently. Adequate availability of these infrastructures should be ensured if these alternate technologies are to make substantial inroads in the urban Indian scenario.

Proper Maintenance

Older and improperly maintained vehicles cause disproportionately more pollution. It has been reported that a badly maintained older vehicle can emit 100 times the pollutants of a properly maintained new vehicle. In India, the problem of improper maintenance is rampant. A study has reported that, at a random check, 43.6 per cent of the total new vehicles failed to meet existing emission standards. The proportion was higher (56.1 per cent) for old vehicles. The study also reported that 57.2 per cent of the two-wheelers and 53.8 per cent of the three-wheelers checked exceeded emission limits (CSE, 1996). Authorities in many Indian cities are now thinking of banning older vehicles into city limits.

Capacity-building Measures

Sustainable transport development requires significant change in the attitudes and lifestyles of commuters. This change is possible only if awareness regarding energy conservation and environmental preservation is instilled. Various capacity-building measures such as training, workshops, and advertisements (through hoardings, television, etc.) can be employed in this regard. Free short-term courses should be organized at regular intervals by the different research and academic institutes in cities to create awareness on the need for maintaining the energy efficiencies of vehicles and for ensuring smooth traffic. These courses may be made compulsory for the drivers of vehicles (while issuing/ renewing licences), but others should also be encouraged to attend them.

Private Co-operative Efforts: Transportation Management Associations

It is possible to think of transportation management associations supported and managed by businesses located in a commercial district. They can pool their resources and provide efficient smaller-level public transport through cooperative efforts.

Institutional Requirements

It has been observed in India that development of urban transportation plans is beset by lack of coordination among multiple agencies. For example, in Mumbai, the suburban rail operations are managed by two zonal railways, and public bus transport is the responsibility of the state transport undertaking. This split in the administration of Mumbai urban transport makes coordination difficult. No plan for improving urban transport can be made in isolation, and both bus and rail transport should form integral parts of such a plan. The problem is compounded by the fact that Indian Railways, in its corporate plan in 1985, did not consider suburban as a priority item in its policy. The coordination problems are evident in the ongoing efforts to initiate MUTP II. The necessity to decouple urban rail transport from Indian Railways was felt, and an autonomous corporation to unite both rail and road transport has been formed. However, the new organization, the Mumbai Rail Vikas Corporation, is yet to acquire the status of a full time institution and assume its duties. Similarly, a Delhi Metro Rail Corporation Limited has been constituted to carry out the implementation of the mass rapid transport system in Delhi.

An option may be to set up a body under the Ministry of Surface Transport, which will work in coordination with the Ministry of Urban Development and the local governments of individual cities. The organization and responsibility of this body may be on the lines of the National Urban Transport Board suggested by the National Commission on Urbanization (NCU, 1988). The cooperation of Indian Railways may be sought whenever necessary. Wherever coordination becomes difficult, because of the presence of rail and road transport, a new body at local level for each city may be formed to look after the urban transport plan in a comprehensive manner.

The government is planning to set up similar bodies. For example, setting up of directorates of urban transport in states and setting up of a National Urban Transport Development Fund are being considered for inclusion in the Ninth Five Year Plan. However, this is yet to gain momentum. I urge that directorates of urban transport be set up in different cities to oversee their developmental path.

Urban transport, as part of a comprehensive urban development plan, requires huge funds. Privatization is an important strategy for the government to develop this vital infrastructure sector. Much has been said about the government's role in promoting privatization and foreign investment, and will not be repeated here. Readers can refer to the previous *India Development Report* (Ramanathan, 1997), the *India Infrastructure Report* (*IIR*, 1996), and Parikh and Ramanathan (1997) for detailed discussion.

Implementation

I end this chapter with a brief note on the implementation of sustainable urban transport plans. There are reports that proper rules are not followed in issuing driving licences in India, resulting in unfit drivers on the road causing safety hazards to all transport users. We have also seen that pollution control rules are not implemented strictly (see discussion on maintenance above). It has to be noted that many of the options discussed in this chapter are likely to fail if implemented with a short-term perspective. Implementation of these options may change the day-to-day living habits of commuters, which is likely to create unrest among them in the shorter term leading to resistance to implementation. For example, from a political angle, persuading voters to pay for using roads that have long been free may result in loss of goodwill to the governing party. However, the resistance is likely to fade away in due course, once the benefits of the changes are realized. Hence, for the success of the options mentioned in this chapter, it is absolutely necessary to have a visionary authority with a political will to implement relevant measures single-mindedly without regard to short-term losses to individuals and with overall, long-term, national gain in mind.

SUMMARY

This chapter has discussed patterns of growth of urban transport in India. It has been shown that the number of personalized vehicles has grown rapidly in comparison with mass transportation modes (rail and bus) which are more energy efficient and environment friendly. The problems associated with such a growth are evident in Indian cities: severe road congestion, reduction in speed, increase in accidents, increased energy consumption, and emission of local and global pollutants. Resource constraint is the main problem for infrastructure development in Indian cities. Several low cost remedies have been suggested in this chapter to reverse the present unsustainable trends. Some of the cities, identified as metropolitan cities with a population of more than one million as per the 1991 census, are smaller but are fast growing. They have the potential to become megacities in the future. Development of public transport integrating land use patterns can avoid transport problems in these cities as they grow. Several suggestions in this regard have been made in this chapter with the experiences reported for Curitiba in Brazil and Singapore. Several other measures are also available for adaptation by Indian cities. They include the area licensing scheme and vehicle quota system as applied to the city of Singapore. Suitable capacity building exercises have to be carried out to instil awareness concerning sustainable transport development in the minds of the travelling public. This can be carried out quite easily by introducing free environmental awareness courses in different cities. Finally, it has been pointed out that the success of the suggestions depends upon political will on the part of the implementing authorities with the overall progress of the nation in mind disregarding the short-term losses.

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7

Power
The Critical Infrastructure

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INTRODUCTION

The installed power generation capacity and generation increased annually at the rate of 9 per cent and 10 per cent (compounded) respectively during the period 1950–1 to 1996–7. This was achieved largely through investments made by the government. It absorbed about 17 to 20 per cent of the total plan outlay in monetary terms doubled every ten years.

Today, both peak load and energy shortages of varying degree are prevalent in the country. The state electricity boards (SEBs), responsible for generating and supplying power in their respective states, are caught in a vicious circle of shortage of resources and poor operational and financial performances. Most of the SEBs have accumulated huge amounts of losses due to irrational tariff. They cannot even meet the day-to-day expenditures, leave aside the investment need for required capacity addition.

In 1990, the Government of India initiated power sector reform to mobilize the required resources to enhance the supply and increase the efficiency of the sector through competition. Since then major steps taken are the opening up of generation, transmission, and distribution activities to private sector investment, necessary amendments of the existing acts, restructuring of the SEBs, and setting up of Electricity Regulatory Commissions. We review the ongoing reform process and related issues in here.

PRESENT STATUS

As on March 1998, the installed power generation capacity in India, owned by utility, was 89,166 MW. This comprised 64,150 MW thermal (coal and gas), 21,891 MW hydel, 2225 MW nuclear, and the balance 900 MW wind. Coal dominates the power generation capacity with a share of 64 per cent in the total. Coal was generally considered the most favourable option. However, with rapid increase in transportation cost, declining coal quality, and the spatial concentration of this resource, other options become attractive. Moreover, coal transportation is increasingly becoming difficult. In the southern and western regions of India, imported fuels like coal, naphtha, fuel oil, and LNG are expected to play a major role along with domestic sources.

India has been able to exploit only 25 per cent of its total hydel potential of 84, 000 MW. Due to inter-state disputes on water sharing, problems of rehabilitation of project affected people, submergence of large tracts of forest, and environmental considerations, the country has added only about 400 MW of hydel capacity annually in the last ten years.

India's nuclear power programme started in the 1960s. However, so far only 2225 MW of nuclear capacity is under operation. Natural gas is an efficient and environmentally clean fuel, but limited domestic availability constrains its use for power generation.

The potential of renewable energy sources has been estimated at 126,000 MW (GOI, 1995). During the Eighth Plan period (1992–7), 920 MW power generation capacity mainly based on wind was added. However, the operational success of these capacities is doubtful.

The actual gross energy generation from utilities was 394 billion kWh in 1996–7, the terminal year of the Eighth Plan, as against the projected requirement of 418.2 billion kWh. Energy generation during the Eighth Plan period has grown at a compound annual growth rate (CAGR) of 6.6 per cent. Energy and peak load shortages were 11.5 per cent and 18 per cent respectively in 1996–7 (GOI, 1998).

The Eighth Plan programme envisaged a capacity addition of 30,538 MW. As against this, 16,422 MW were added during the plan period, about 46 per cent less than the target and 23.26 per cent less than the capacity that was added during Seventh Plan period. The main reasons for the shortfall in capacity addition were inadequate funding of state and the central sector projects and unresolved issues regarding fuel linkage and power purchase agreements, etc. for private sector projects.

The demand for electricity in the country is growing at a CAGR of 8 per cent or more. Consumption of electricity (drawn from utility) was 267 billion kWh in 1996–7. Per capita consumption has grown from 178 kWh in 1985–6 to 335 kWh in 1996–7. The Industrial sector accounted for 34 per cent of total consumption, followed by the agricultural sector with 33 per cent, and the domestic sector with 16 per cent. Recently, the domestic sector shows the highest growth rate in electricity consumption (9 per cent during 1992–6). The share of industry has declined considerably due to high power tariff and poor quality supply, and it is increasingly becoming dependent on captive generation. Total captive generation capacity was 11,013 MW in 1994–5. Consumption in the agricultural sector, on the other hand, is rising at a rate of 7–8 per cent due to the government's policy of supplying heavily subsidized or free power to this sector and massive rural electrification.

The fifteenth Electric Power Survey estimated the energy and peak load requirements at busbar as 569 billion kWh and 95,757 MW respectively in 2001–2, the terminal year of the Ninth Plan. The installed capacity requirement in the same year works out to nearly 131,726 MW. The Planning Commission has assessed that capacity addition in the range of 40, 245 MW is feasible. This would lead to energy and peak load deficits of about 1.4 and 11.6 per cent respectively in the year 2001–2.

Electricity is a concurrent subject in the Indian Constitution, whereby decision making and implementation involve both the central and state governments. Till 1990, the power sector in India has evolved as a public monopoly. The power sector was governed by the Indian Electricity (IE) Act, 1910, and the Electricity Supply (ES) Act, 1948.

The institutional structure of the power sector in India, which broadly holds even today is as follows:

- The SEBs and Electricity Departments (EDs) are statutorily responsible for the efficient and economic development of the power sector in their respective states/union territories.
- Central generating companies (the National Thermal Power Corporation [NTPC], the National Hydro-electric Power Corporation [NHPC], and the Nuclear Power Corporation [NPC]) generate and supply power in bulk to the SEBs.
- The Central transmission company, the Power Grid Corporation of India Ltd (PGCIL), established in 1989, aims at developing a national grid. It has taken over the construction, operation, and maintenance responsibilities of the transmission lines of central generating companies.
- State power corporations are principally involved in construction and commissioning of power plants in the respective states. The plants are generally handed over to the SEBs on completion.
- Five private generation and distribution companies are involved in generation and distribution in some important cities.
- Distribution licencees supply power in a specified area.

The Ministry of Power (MOP) has overall responsibility for power sector development. The activities of the MOP include formulating policies and plans, processing power projects for investment decisions, research and development, formulating legislation pertaining to power generation and supply, and providing the required linkages between other ministries and departments in the central government, state governments and the Planning Commission. The Central Electricity Authority (CEA), a statutory body set up under the provisions of ES Act, may be considered the technical wing of the MOP. While the CEA recommends the technical component of a plan and its financial implications, it is the MOP that has final decision-making authority. Power planning and development have been based on a regional approach to maximize utilization of unevenly distributed energy sources.

The SEBs, created under the ES Act, have monopoly right to generate and distribute power in their respective states. The constitution and composition of SEBs, their power, operations, staff, financial accounts, and audit procedures are comprehensively covered under the ES Act. The ES Act empowers state governments to give directions on policy matters, if necessary, to guide the functioning of the boards. The issue of what constitutes policy has been left open to interpretation. In practice, the directions from the state government are not just limited to matters of policy but extend to operations.

The capital structure of the SEBs is primarily debt based. Sources of capital financing are state government's loans, loans from financial institutions, open market borrowing, internally generated resources, external borrowing via central assistance, and external aid routed through the central government to state government as a part of the plan resources. The share of state government loans, which are the main source of finance for the SEBs, has been declining in several states due to the deteriorating resource position of these states. Consequently, the SEBs have resorted to borrowing from the market and financial institutions, resulting in substantial increase in the interest burden. This leads to increase in the cost of power generation and supply. Also, due to the poor liquidity positions of the SEBs, the capital resources are very often diverted for working capital expenditure or to adjust for the interest and electricity duty due to the state governments. All this results in substantial delays in completion of the projects and consequent cost overruns.

Irrational tariff structure is perhaps the single most important reason for the deteriorating financial health of the SEBs. The average revenue realized is less than the average cost of generation in almost all SEBs. The agricultural sector gets electricity at a heavily subsidized rate or even free in certain states. This sector contributes merely 4–5 per cent of total sales revenue of the SEBs, while consuming around 30 per cent of their total sales. The domestic sector accounts for 10–11 per cent of sales revenue as against a consumption of 16–17 per cent of sales. Currently, industrial and commercial customers partly cross-subsidize agricultural and domestic customers. Typically, while Indian agricultural and domestic consumers pay Rs 0.21 and Rs 0.91 per kWh respectively, industrial consumers pay Rs 2.34/ kWh. The effective subsidy (difference between the cost of supply and sales realization) to the domestic and agriculture sectors in 1996–7 was Rs 18,200 crores (GOI, 1997). Cross-subsidies compensates 42 per cent of the subsidy provided to these two sectors.

The ES Act vests the responsibility of setting tariffs for different consumers in the SEBs. However, all the boards suffer from excessive political interference by state governments in this task. Social and political considerations rather than commercial and efficiency objectives decide tariff. Tariff revisions by the SEBs are generally carried out on ad-hoc bases. The sole criterion is the absorbing capacity of the consumers. Poor operational performance due to low plant load factor (PLF) of thermal power plants, high auxiliary consumption, overstaffing, and large transmission and distribution (T&D) losses, further aggravate the problems. Some of these are outcomes of political compulsions as well. An SEB with a geographically widespread distribution system is ideal to give jobs to party workers spread all over the state (Parikh, 1998). The SEBs have nearly a million employees and are grossly overstaffed, which creates a vested interest in the sale of electricity. It is common knowledge that a substantial part of T&D losses is, in fact, theft of power.

Significant delays in adjusting tariffs to reflect the increase in cost of generation and supply, result in huge financial losses for the boards. Negative internal resource generation of the SEBs is the fundamental problem for power sector development. According to the ES Act, 1948, SEBs are required to earn a minimum rate of return (ROR) of 3 per cent on their net fixed assets in service after providing for depreciation and interest charges. However, excepting three SEBs, others have negative internal resource generation, which is deteriorating over time. The average ROR was –17.6 per cent in 1997–8, with a loss of Rs 10,000 crore (GOI, 1997).

POWER SECTOR REFORMS

The Eighth Plan demanded additional capacity of more than 30,000 MW with an investment of Rs 126,000 crore. The SEBs, because of their poor financial health, were neither in a position to finance internally nor could they tap the capital market. The World Bank stopped lending to electricity boards. Hence it became imperative to invite the private sector to mobilize resources for expansion. Given the capital intensity of the power sector, the resources available in the domestic capital market were not sufficient. Hence it became necessary to mobilize foreign investment through schemes like equity partnership, build, operate and transfer (BOT), or in the form of portfolio investment from foreign financial institutions to Indian/ foreign managed companies (Ranganathan, 1996). In 1991, the government allowed private sector participation in power generation. The Indian Electricity Act, 1910, and the Electricity (Supply) Act, 1948, were amended to usher in a new legal, administrative, and financial environment. According to the amended ES Act, 1991, a generating company can now be formed in the public sector, the private sector, or the joint sector. Efforts at power sector reform have included:

- allowing private sector participation in power generation (1991);
- restructuring of SEBs (since 1993);

- private sector participation in transmission and distribution (1998);
- setting up of Central Electricity Regulatory Commissions (CERC) (1998).

Private Sector in Power Generation

Private companies like the Tata Electric Company, the Ahemedabad Electricity Company, and the Calcutta Electric Supply Corporation have been in existence since before Independence. They operate as licencees of the SEBs and are involved in generation and distribution. However, a fresh initiative began in the early 1990s when the government allowed the private sector to set up generating stations and sell power to the SEBs. It has therefore amended the ES Act to permit private generators to supplement the SEBs' generation. Under the legal provision, the agreement between a private generator and an SEB would be a purely commercial one with only certain technical parameters to be prescribed by the CEA.

By the end of September 1996, private companies proposed to set up 265 projects totalling 63,238 MW of generation capacity and an investment of Rs 229,141 crore. In addition, foreign companies intended to invest Rs 97,637 crore to set up fifty-five power projects with a generating capacity of 26,668 MW (CMIE, 1996). However, given the dismal financial conditions of the SEBs, sole off-takers of the power, the project developers asked for guarantees[1] from the government on payments of their sales to the SEBs.

To develop confidence among investors as well as to gain quick capacity addition, the Government of India decided to offer counter-guarantee to eight 'fast track projects', against the commitments of the state governments on payment for energy supplied. However, the idea of counter-guarantee was later abandoned for other projects since though these guarantees could increase confidence levels of lenders in the initial phases, extensive use of them could lead to large liabilities for the government. Some of the alternatives to counter guarantee as explored and applied by the government are:

- permitting direct supply of power by the independent power producer (IPP) to high tension consumers,
- opening escrow account[2] with financial institution's counter guarantee,
- linking power generation with distribution,
- requesting the World Bank to provide partial guarantee which will be accompanied by a precondition of reform and restructuring of the power sector in the concerned state.

The awarding of power projects to the IPPs was started with one-to-one negotiation through the memorandum of understanding (MOU) route, based on the guideline on technical parameters from the CEA. The problem with the MOU route and CEA guidelines is dramatically illustrated by the Enron episode. The main problem with the CEA guideline in this case was that it was a cost-plus formula, in that it provided a guaranteed return without any control to ensure that the capital cost was minimized (Parikh et al., 1997).

Following intensive criticism on lack of transparency and drawbacks, since February 1995 the competitive bidding route has been adopted for awarding power projects to the IPPs. However, this also has also led to certain problems. Although, in principle, the higher the level of competition, the lower will be the price, this approach presupposes a sound reputation and past records of the bidding parties. Several states that went in for competitive bidding ended up awarding projects to promoters who had no previous experience in the power sector. These promoters bid low prices but when the project was awarded to them they could not get financing. As a result many of these projects are still on paper. Therefore, unless reviewed with proper expertise, we will end up with projects which have low prices but little chance of implementation.

To explore the advantage of economy of scale associated with large-scale thermal power plants, the MOP has decided to consider 'mega projects' with a capacity of 1000 MW or above, for supplying power to more than one state. A number of foreign governments exhibited interest in setting up large power projects. To get fast power from these projects, they may be awarded through government-to-government negotiations rather than through competitive tendering. A committee has been set up to frame the gudielines. A policy on mega projects has been announced in October 1998. The main highlights are:

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[1] SEBs owe a huge amount to central organizations like NTPC and Coal India Ltd (CIL) from which they buy coal and power. The NTPC stopped power supply to West Bengal, Bihar, and Orissa during September 1998, due to mounting arrears of about Rs 3000 crore of the SEBs of these states. The NTPC was forced to close down its plant in West Bengal which caused a significant loss to the company as well. In these circumstances, guarantees asked for by IPPs are rational.

[2] The escrow mechanism is a method of mitigating risks in projects. An escrow consists of cash or documents that are kept out of the reach of contracting parties. The serves as a backup in the event of default by any contracting party. In the case of the power sector the contracting parties would be the IPP, the SEB, and the escrow banker/FIs involved in the collection of bill payments for the SEB. Usually, the bank with which the escrow account is maintained, collects bill payments and deposits into the escrow account. According to the contract a fixed amount of money is always kept in the account. The SEB can withdraw the remaining money for its own use.

- customs duty exemption and easing of administrative controls;
- those states which have State Electricity Regulatory Commissions and privatized distribution in cities with population above one million will be eligible to buy power from the mega projects;
- a Power Trading Corporation (PTC) will be set up which will buy power from the private mega power projects and sell it to the eligible states;
- there would be no intermediate trading company for public mega power projects.

Payment security to mega power projects will be ensured through letters of credit issued by states. As a last resort, in case of default, the PTC will have access to the central plan allocation of the states. A tripartite agreement will be signed between the Reserve Bank of India (RBI), the PTC, and the state government to ensure payments to the IPPs and the PTC.

More than seven years after reform has been initiated, only 1346 MW of capacity under the private sector is in operation (Table 7.1), and even the fast track projects are crawling. Counter-guarantees of three fast track projects have been signed as recently as in 1998 and two projects are still waiting.

TABLE 7.1

Power Plants in Operation under the Private Sector, 1998

Plant	State	Capacity (MW)
Gujarat Torrent Energy	Gujarat	411
Essar Power	Gujarat	515
GVK Industries	Andhra Pradesh	212
Spectrum Power	Andhra Pradesh	208
Total		1346

Source: Powerline, September 1998

The present situation is attributed to the lack of clarity in government policy on several issues such as

- developing a model framework for power purchase agreements,
- providing guarantees of some kind or other for the off-take and payment of power,
- inadequate transmission capacity to evacuate power,
- delay in finalization of fuel supply and transportation agreement.

In addition, the clearance process is far too long due to the involvement of a multiple number of departments. Although, the nodal ministry is the MOP, clearances have to be obtained from other ministries such as coal, petroleum, railways, surface transport, environment, and finance (perhaps no other infrastructure sector depends so heavily on other sectors). Political uncertainties, seemingly endless changes or debates about rules, decisions, and transparency further add to delays. A new government rejects a deal made by the previous government and fresh negotiation only extends the delay. Some IPPs have been waiting for the final word on their projects for almost six years. PSEG Global, a foreign company which entered the power market of India and China at the same time, has two projects in operation and three projects under construction in China, whereas it is still struggling to get financial closure of its first project in India (*Powerline*, August 1998). To simplify the clearance process certain measures have been set into motion:

- Earlier a techno-economic clearance from the CEA required 17 clearances, which have now come down to 5.
- Projects below Rs 1500 crore of foreign investment do not require clearance from the Foreign Investment Promotion Board (FIPB) (*Powerline*, April 1998).
- Projects up to Rs 1000 crore do not require CEA clearance. State governments are allowed to clear such projects (GOI, 1998).
- The ministry of environment and forests has agreed to delegate to states the power for environmental clearance of (i) coal-based plants up to 500 MW based on fluidized bed technology subject to sensitive areas restrictions, (ii) power stations up to 250 MW on conventional coal-based technology, and (iii) gas/naphtha based stations up to 500 MW.

Despite all the hurdles, proposals worth 62,000 MW are still alive, of which 27,000 MW are with Power Purchased Agreements, 19,250 MW awaiting techno-economic clearance from the CEA, and 15,000 MW are likely to take off (*Powerline*, September, 1998).

Policy to Supply Liquid Fuel for Power

To deal with growing capacity shortages, the Government of India decided in December 1995 to create 12,000 MW of capacity based on liquid fuel, assuming there would be sufficient naphtha surplus. These projects were expected to begin production within eighteen months of financial closures. The liquid fuels approved were naphtha, LSHS, and LSFO. Initially public sector oil companies, which have marketing rights to sell petroleum products, were entitled to supply fuel to the IPPs. The fuel linkage would be decided by the central government. The IPPs have to sign a Fuel Supply

Agreement (FSA) with the assigned oil company. Later on, private sector oil companies were also encouraged.

Twenty million tonnes (Mt) of liquid fuel will be required which includes nearly 16 Mt of naphtha. Allocations to the states were based on their power shortages and they were advised to select the IPPs through competitive bidding. The Government of India has decided to keep the pricing of liquid fuel outside the administered pricing mechanism (APM). Prices will be based on imported cost and will include customs duty, port charges, handling and storing charges, and the transportation cost from port to project site.

The Liquid fuel policy is another example of how policies are evolved and implemented without any insights, planning, and analysis. After three years of the policy announcement, even the fuel linkages have not yet been finalized. Several issues have not been considered:

- It is a waste to use an expensive fuel like naphtha for power generation. Economic value addition of naphtha is much higher for its use in fertilizer and petrochemical manufacturing than power generation. In addition, volatility in terms of chemical characteristics and price makes it hazardous (in terms of transportation and storage) and uneconomical for use in power generation.
- As against naphtha demand of 16 Mt, surplus production by Indian refineries has been projected as only 3 Mt. Therefore the current liquid fuel policy requires imports of 12–13 Mt, which involve a drain of a large amount of foreign exchange. In addition, port facilities are not adequate to handle this quantum jump within such a short period.
- Infrastructure requirement connecting port to project site has not been given enough thought. The railways would require at least 4800 additional tank wagons. Besides a huge investment by the railways, about Rs 3900 crore will be required to set up exclusive infrastructure such as tankers, rail dispatch facilities, additional port facilities, etc.

Hydro Policy

Apart from being a renewable and non-polluting source of energy, hydel power has several benefits.

- The costs of generation, operation, and maintenance are much lower than for any other mode of power generation.
- It does not have any fuel cost; therefore escalation in cost of generation is minimal.
- Additional benefits like irrigation, flood control, and drinking water supply can accrue from hydro projects.
- A hydel power station can be turned off and on very quickly which makes it ideal for meeting peak requirement. In a typical power system, 60 per cent of the demand arises for 24 hours, the balance 40 per cent is prevalent for 6–8 hours per day only. Thus a power system based on total thermal power will have to back down partially during off-peak hours, thus decreasing PLF and increasing cost per unit generation. This can be circumvented by hydel power, which can be put on quickly whenever required and turned off during low demand periods, comprising 40 per cent of the capacity in the system.

Over the years the thermal–hydro ratio in the Indian power system, has fallen from 60:40 to 70:25. Many thermal power stations require to back down during off-peak hours, especially in the eastern and western regions (TOI, 1998).

The government has encouraged private sector participation in developing hydro projects of 100 MW and above. However, because of risk due to uncertainty in energy availability, low return, long gestation period, inevitable controversies over the environmental cost and the rehabilitation of people affected, this sector has not attracted much private investment. Out of project proposals of nearly 100,000 MW worth received from the private sector, only twenty-nine proposals totalling 12,780 MW of capacity were based on hydro power. Recently, a new hydel power policy has been announced to enhance private participation. The policy measures include:

- Introduction of a differential tariff system which proposes a higher tariff by 25 per cent for generation during the peak period.
- The normative availability factor has been reduced from 90 per cent to 85 per cent in the Himalayan region and to 87.5 per cent for projects in the southern peninsula.
- A concept of evaluating geological risks in hydel projects has been introduced. A committee would be set up to evaluate risks in monetary terms.
- The policy promotes the joint venture framework.
- The MOU route would be followed for awarding projects under 100 MW, while competitive bidding is to be adopted for larger projects.
- A cess would be levied on hydro-electricity generated by state and central schemes and the amount would go towards the hydro development fund.
- Funds in central and state budgets along with supplementary funding from the Power Financing Corporation would back the policy.

However, there are still a number of unresolved issues discouraging the IPPs in large hydro development projects. Inter-state disputes on water sharing, environmental clearances, and land acquisition are important among them.

Some additional options can be included to expedite the development process:

- The developer needs to be insulated from the problems arising out of land acquisition and rehabilitation. The state government should assume full responsibility for this.
- Environmental courts should be set up for the speedy settlement of the many petitions that are usually filed.
- A portion of the electricity generated from hydel projects may be permitted to be directly sold to industrial consumers so that the project becomes financially attractive.
- To promote small projects, the government should give licencee status to the IPPs to implement projects and sell electricity in the locality.

The Kyoto protocol provides an attractive alternative for inviting free equity from developed countries for hydro development. Inviting foreign grants in the form of equity 'emission credits' can be catalytic for improving this sector. The Global Environmental Facility (GEF) is already funding several small hydel projects in Himalayan region. However, the government has to take this issue to the global arena and to frame mechanisms for inviting equity in this form.

Private Sector in T & D

The current T & D system is inadequate to cope with the present level of power generation. Some of the serious problems are:

- high T & D losses of almost 23 per cent of the power generated, as against 7 per cent in China and 10 per cent in Thailand;
- frequent grid failures causing complete power outages, which result in tremendous economic losses;
- frequent breakdowns, burning of transformers, and melting of conductors in the distribution in the system;
- inadequate transmission links leading to simultaneous shortages and surpluses, within and between regions (Box 1).

The main reasons for this state of the T & D system are lack of maintenance, planning, management, and investment. Only 27 per cent of the total investment in the power sector goes to T & D. According to the Report of the Committee on Power (Rajadhyaksha Committee), this figure should be closer to 50 per cent. Appropriate demand management is absent. In the total connected load, the ratio of high tension (HT) to low tension (LT) load is about 1:3 as against 1:1 in most developed countries. In the LT segment technical losses are much higher and, moreover, theft and pilferage through tapping directly into the feeders is much easier. Although the official estimate of T & D losses is 23 per cent of the power generated, most independent experts put the figure at anywhere between 30 and 40 per cent (GRIDCO in Orissa has owned up to losses of 50 per cent. Loss is as high as 60 per cent for the Delhi Vidyut Board). Theft and pilferage at distribution level cause most of these losses. Theft is made easier because of low voltage distribution lines, metres that can be tampered with, and connivance of SEB staff. This has adversely affected SEB finances. The SEBs are reluctant to develop grid discipline; often overdrawing causes grid failures. The load dispatch process in most states is not automated. This leads to inefficient control,

Box 1

Need for grid integration

The Eastern region has energy surplus. Yet due to lack of transmission facilities, the surplus energy cannot be exported to power deficit regions. Even within the eastern region certain areas suffer from severe power cuts and shortages. The NTPC has been backing down its generation and even stopped generating on account of low demand in the eastern and northern regions. During October 1997, it reported a loss of 1020 MW of generation. During the first seven months of 1997–8, the company had to back down generation totalling 4.29 billion kWh. If all units are allowed to operate as per schedule the region may witness surplus supply ranging from 1500 MW to 2000 MW during off-peak periods. Andhra Pradesh, on the other hand, continues to suffer power shortages. There is a 20 per cent cut for high-tension industries and a daily two hour cut for domestic users. A transmission link between the eastern region and Andhra Pradesh may ease the situation in Andhra Pradesh by transferring the surplus power from the eastern region. Studies by the CEA reveal that the development of inter-regional links could reduce the requirement for new generation capacity by 7000 MW by the end of the Tenth Plan.

and monitoring, and hence waste of power due to suboptimal level of operation.

The problems are expected to exacerbate in the near future. As generating capacity is increased to meet demand, the strain on existing transmission networks will be unbearable unless corresponding investments in T & D take place. To evacuate the targeted additional 42,000 MW power in the Ninth Plan, an investment requirement of Rs 1260 billion is estimated for the T & D system. Recently, Parliament has passed the transmission bill permitting private sector participation in transmission. The bill allows private firms to invest in facilities for transmission and to operate and maintain these facilities. The Central Electricity Regulatory Commission (CERC) and the State Electricity Regulatory Commissions (SERCs) have been empowered to grant licences for inter- and intra-state transmission respectively. The government will continue to retain control over power transmission through central grids or the SEBs. The immediate beneficiaries of the bill are projects in Karnataka and Madhya Pradesh. In Karnataka, the Karnataka Electricity Board (KEB) and National Grid, UK, are planning to form a joint venture company for evacuating power from the IPP projects in the Mangalore area.

The SEBs have virtual monopoly over power distribution. The state governments should have opened up the distribution sector along with generation. If they had done so, the creditworthiness of the SEBs, which is the biggest hindrance in the way of IPP development, would not have been an issue. Multilateral agencies like the World Bank and the Asian Development Bank are insisting on some form of privatization of distribution as an essential element of reform and restructuring. Under this pressure a number of states like Orissa, Haryana, Rajasthan, and Andhra Pradesh have already taken initiatives in privatization of distribution. The experience of private distribution companies in Mumbai, Surat, Ahmedabad, Calcutta, and Noida has been encouraging. The Noida Power Company Ltd (NPCL) represents India's latest experiment in the privatization of electricity distribution. System loss, which was 29 per cent before the taking over of the NPCL, has drastically decreased to 7 per cent. Other private utilities have managed to bring down T & D losses to well bellow 12 per cent through installing a modernized grid and distribution system.

Restructuring of SEBs

IPPs ask for guarantee due to the poor financial health of the SEBs. International lenders are still hesitant to finance IPP projects whose sole source of revenue is the SEBs. Even if they agree to lend, they ask for a premium to cover the high risk. The World Bank is willing to provide partial guarantee only if the state agrees to reform and restructure the power sector.

At this stage, the organizational restructuring of the SEBs has become inevitable. Theft reduction, tariff rationalization, increasing revenue recoveries, and cost control are some of the urgent actions needed for improving the situation. State-wise restructuring of electricity boards started with the following broad objectives (Dixit, Sant, and Wagle, 1998):

- to make the SEBs commercially viable;
- to improve operational efficiency of the SEBs;
- to reduce dependence of electricity utilities on government budgetary assistance;
- to delink electricity tariff fixation from the politicians;
- to provide better quality service to the consumer.

Orissa was the first state to undertake a comprehensive reform and restructuring programme under guidance and financial assistance from the World Bank (see Box 2). As the reform program is still ongoing, it is too early to make any judgement about the restructuring model. However, the Orissa experience is a very valuable guide in the process of restructuring any other electricity board.

The Haryana SEB has been split into a generation company called the Hayrana Power Generation Corporation (Genco) and a transmission company called the Haryana Vidyut Prasaran Nigam (Transco). The SERC has also been set up which will fix tariffs and issue licences to power generating companies. The Government of Rajasthan is also implementing power sector reform. Andhra Pradesh, Karnataka, Tamil Nadu, Maharashtra, Madhya Pradesh , Kerala, and West Bengal have taken reasonable amount of initiatives towards reforms.

The success of power sector reform largely depends upon the improvement of the financial health of the SEBs. If they are secure, not only will it expedite the process of private sector participation, they themselves will be able to tap funds from the international market on account of their creditworthiness.

Electricity Regulatory Commissions

Under a new system of mixed entities comprising private and public firms, regulatory bodies are required to provide a level playing field to all generating firms,

Box 2

Power Sector Reform in Orissa

Orissa adopted a restructuring model with three major components: (1) un-bundling of the vertically integrated utility, (2) privatization of its components, and (3) distancing the tariff fixation and regulatory functions from the state government. The state initiated the reform process in 1993 and now has two power generation companies, the Orissa Power Generation Corporation (OPGC) and the Orissa Hydro Power Corporation (OHPC), and a combined transmission and distribution company—the Grid Corporation (Gridco).

The distribution division will be further divided into four separate companies. Initially, Orissa adopted the management contract model for distribution. The Bombay Sub-urban Electricity Supply (BSES) was awarded contracts for distribution in one of the four zones. However, it was not successful. Gridco terminated BSES's distribution management contract after six months of operation due to unsatisfactory performance and is planning to privatize its distribution by April 1999. The present plan envisages power being sold initially to Gridco which will in turn sell to the distribution companies through bulk supply agreements. In future, the distribution company is expected to enter into direct power purchase. The Orissa government has decided to privatize the OPGC, offloading 49 per cent of its stake to private investors.

Responsibilities and powers of the Orissa Electricity Regulatory Commission (OERC), created in 1995, include:

- issue of licences and stipulation of licence conditions for all power utilities,
- regulation of the licencees so that they will perform in an efficient, economical, and equitable manner,
- regulation of the purchase, distribution, supply, and utilization of electricity, the quality of service, the tariff and charges payable safeguarding the interests of the consumer, and at the same time making supply and distribution financially viable with appropriate charges of price and duty.
- promotion of a fair competitive market for the participation of the private sector.

reduce system costs, and protect consumer interests (Cho, 1996). The Electricity Regulatory Commissions Ordinance, introduced on 26 April 1998 stipulated creation of a Central Electricity Regulatory Commission within three months but left it to the state to decide whether to set up a State Electricity Regulatory Commission or not. Central and State Regulatory Commissions would be the nodal agencies for all tariff-related matters—in generation, transmission, and distribution. The Ordinance directed that no consumer or class of consumer should be charged less than 50 per cent of the average cost of supply. However, if the state commission considered it necessary to charge the agricultural consumer less than 50 per cent it would be allowed to do so uptil three years from the commencement of the Ordinance. In case a state wishes to provide for higher subsidies beyond the three-year period, the amount will have to be compensated from the state budget.

In July 1998, a CERC has been created to set tariffs and regulate inter-state power exchange, licensing, planning and other functions for all central generation and transmission utilities. At the state level, Haryana and Madhya Pradesh have already set up their commissions. Orissa, of course, has had one since 1995. About 80 per cent of the remaining states have indicated their interest in setting up state regulatory commissions.

The role of the CERC in the states will be largely advisory. It cannot overrule an SERC. All appeals against an SERC decision can only be handled by the state high court.

Some Issues Related to Power Sector Reform

Rational Pricing

The major challenge that the regulatory commission will face is to arrive at a rational tariff structure. The important question is how conflict between economic rationality and social interest will be resolved for agricultural and domestic customers. Currently, Indian agriculture and the domestic consumer pay Re 0.21 and 0.91 per kWh respectively, while the supply cost of power is Rs 1.86/kWh (GOI, 1997). Industrial and commercial customers partly cross-subsidize them. In most states, industries pay over Rs 3.50/kWh (including demand charges, electricity duties, etc.) and account for 25–40 per cent of power consumption but 35–80 per cent of sales revenue (Table 7.2).

TABLE 7.2

Share of Industry in Power Consumption across States

(per cent)

State	Consumption	Revenue
Delhi	25	34
Gujarat	39	66
Maharashtra	34	49
Uttar Pradesh	23	47
Maddhya Pradesh	42	82

Source: Powerline, vol. 2, no. 11.

The commercial viability of power sector reforms largely lies in a rational tariff for all consumers. The ratio of tariff to cost was only 76 per cent in 1996–7. This position is likely to be further aggravated when substantial high cost private power generation comes on stream. As the proportion of this new high cost generation goes up, the pooled cost of generation is also expected to rise significantly.

It may be unfair to further hike industrial tariff. The biggest danger is that the industrial consumer will go in for the captive option. And this has already started to happen. Nearly 63 per cent of industrial consumption in Orissa is met by captive generation. In addition, private developers are now allowed direct sale of power to industries; therefore it will no longer be possible to subsidize other consumers at the current scale.

As Arun Ghosh quoted, electricity tariffs proposed for UP by World Bank consultants are a minimum of Rs 3 per unit for agriculture and Rs 5–6 per unit for all other consumers (Ghosh, 1997). The question is whether the SEBs will be able to charge their customers suitably enhanced tariffs. Looking at the present trends it seems improbable. (Godbole, 1998). Only by a transparent process of tariff fixation and consumer education, will it be possible to reduce consumer resistance to the repeated tariff revisions.

Co-ordination in System Operation

As far as unbundling of generation, transmission, and distribution is concerned, one technical problem may arise regarding operation of the entire system. Electricity cannot be stored; its generation and use must be simultaneous. The demand for electricity varies significantly over a twenty-four hour period and also during different seasons. There is need for close co-ordination between generation, transmission, and distribution. In addition, constant monitoring is required to ensure that generation is always optimal, keeping system cost at a minimum. Therefore, operation of three separate entitites wanting to maximize their profits may lead to complete chaos. Keeping in view the coordination problems between different organizations in India, resolving this issue will be a great challenge to regulatory commissions.

Merit Order Operation

By providing guarantee at 68.5 per cent or more of PLF (the new norm is even higher at 75 per cent) to the new power plants, the SEBs will be forced to back down existing capacity routinely and operate largely for peaking purpose. This will destroy the concept of merit order operation as the cheapest generation will be used for producing small amounts of power, while bulk power will be taken from the most expensive one.

Peaking capacity shortage is more acute in India at present than energy shortage. Therefore providing guarantee at higher PLF to all the new plants, will mean that the SEBs end up with significant energy surplus. Unless the SEBs match the load profile with demand by securing appropriate PLF, the economics of power generation can be seriously impaired. In some circumstances, private power investment would be of greater economic benefit to the SEBs, if such investment were made in power plants which could be best used for peaking or at intermediate load. The government guidelines on the tariff for the IPPs should be made flexible enough to accommodate such operational regimes.

Regionality of Private Power Programme

Proposals from the IPPs are concentrated in states that are already better off in power development. The more backward areas are receiving very few of these proposals. Obviously market will drive investments to the more developed areas. This will only aggravate the present distortions and the states that are being neglected will suffer further setbacks. Such a course will lead to rising social tensions and endanger national unity. Public sector power development programmes for these states may be a solution.

Environmental Aspects

Large-scale power projects can have severe environmental consequences. They can involve massive emissions of air pollutants. In addition, there are large quantities of solid waste from coal-based power plants that must be disposed of. Although generation from many small plants may also lead to similar quantities of emissions and waste, they would be distributed and may be easier to handle. Therefore, while bargaining for lowest tariff, particularly from a mega project, the government should ensure that the costs to society in the form of public health impacts, contaminated landfills, and acidified lakes and soils have been included. Otherwise, there is always a possibility that what looks like an economically efficient outcome is socially and environmentally unsustainable.

Regulatory Commissions: Need for Transparency

The Central and State regulatory commissions are to set electricity tariffs. They will have to balance the interests of the consumer and the supplier. To ensure this, they need to function in a transparent manner so that they not only remain accountable to society but also appear to be so.

CONCLUDING REMARKS

Power network is the backbone of economic development. Being a key infrastructure, the availability of quality power in the required quantity would be one of the important determinants in the success of India's recently introduced, high-growth-oriented economic policy. Given the capital intensity of the sector and poor financial condition of the SEBs, steps towards power sector reform taken by the GOI are right on time. However, the success of the reform programme would largely depend on efficient management of the transition period and pursuance of a transparent policy. Problems of administrative, technical, and political nature as experienced so far need to be tackled with great sincerity. Other countries' experiences in power sector reform may be useful (Box 3). The government would have to

Box 3
Power Sector Reforms in Other Countries

After Chile's path-breaking restructutring of the electricity sector in 1982, several countries, including Argentina, Australia, New Zealand, Norway, and the UK have undertaken reforms(Bergara and Spiller, 1997).

The UK

The UK's power sector was transferred from public to private ownership and put under regulatory and pricing mechanism designed to foster and sustain a high level of efficiency through competition. On 31 March 1990, the state owned Central Electricity Generating Board (CEGB) was divided into four public limited companies: National Grid, Power Gen, National Power, and Nuclear Electric. The twelve Regional Electric Companies (RECs) that owned the local distribution assets were given shares in National Grid and were sold to the public in December 1990. The modern nuclear stations were finally removed from public ownership and privatized in June 1996. The following are the consequences (Newbery, 1998):

- labour productivity doubled
- nuclear output increased by 28 per cent with no increase in capacity
- new entrants accounted for over half of new capacity
- fossil fuel cost/kWh fell by 45 per cent in real terms
- nuclear fuel cost/kWh fell by 60 per cent in real terms
- the real rate on assets valued at historic cost rose from 14 to 24 per cent
- CO, SO_2, and NOx per kWh fell by 28 per cent, 40 per cent, and 40 per cent respectively

New Zealand

Prior to the mid-1980s, electricity distribution was under various government departments. Prices to the commercial and small manufacturing sectors were significantly higher than prices to households, implying a significant degree of cross-subsidization.

In 1987, the Electricity Corporation of New Zealand Ltd (ECNZ) was formed as a state-owned enterprise and the corporatization of generation and transmission took place. In 1988, generation was deregulated and in April 1994, the retail segment of the industry was fully deregulated and the customers got the right to choose their supplier. The ECNZ, however, was not subject to any electricity sector specific regulation apart from the supply standards and safety regulations. In July 1994, transmission was separated from the ECNZ and Trans Power was formed as a state-owned enterprise. It owned the main grid and had the responsibility of carrying the electricity of any potential client from any entry point to its destination on the main grid. In 1995, the ECNZ was further divided by chanelling out 30 per cent of its generation capacity into a state-owned enterprise CONTACT.

In the distribution sector, there is open competition for construction and ownership of new or rebuilt network assets, and entry is open to all. To coordinate the market, the Electricity Market Company (EMCO) was established in 1993. It is owned by TransPower, ECNZ, CONTACT, and the Electricity Supply Association in New Zealand. The company has established an electricity exchange including a physical spot market and forward markets for short- and long-term tradable contracts for electricity. The market commenced trading in 1995.

According to the Wholesale Electricity Market Development Group Report, the benefits of this restructuring process are significant: between 1987 and 1994, the ECNZ's average unit costs have declined and substantial improvements have occurred in efficiency and productivity in distribution and retailing. After corporatization, labour and capital productivity showed a generally increasing trend.There has been a movement toward rationalization of prices. Rapid progress has been made on reducing cross-subsidies while the new organizations are much more oriented towards meeting customers' needs.

monitor the transition and periodically review the status so that midstream course correction can be made if necessary.

GLOSSARY

Electrical Energy

Energy is the capacity to do work. Energy can exist in many forms and can be converted from one form to other. Electrical energy is one form of energy and measured in Watt hours.

Power

Power (p) is the rate of energy use and measures the intensity with which energy can be delivered.

$$P = \text{energy/time}$$

If energy is measured in Watt hours, power is measured in Watt.

Peak Load

The maximum power demand registered by a consumer or a group of consumers or a system in a stated period of time such as a day or a month or a year.

Plant Load Factor (PLF)

PLF is the most commonly used indicator for the generation performance of a power plant and defined as

$$\text{PLF} = \frac{\text{Annual energy generated by the plant}}{(\text{Capacity of the plant}) \times 8760} \times 100$$

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8

Coal, Oil, and Gas

Anjana Das and Jyoti Parikh

ENERGY SOURCES

Both commercial and non-commercial energy sources meet the energy need in India. Coal, oil, natural gas, nuclear fuel, and hydro-electricity are among primary commercial energy sources, whereas 'non-commercial' energy sources include agricultural residue, firewood, and animal waste.[1] The share of non-commercial energy in total energy consumption has declined from 70 per cent to 33 per cent between 1971 and 1990 (Parikh and Ramanathan, 1997). Commercial energy consumption in India has grown from 92 million tonnes of oil equivalent (mtoe) in 1980 to 245 mtoe in 1995, registering a compound annual growth rate (CAGR) of 6.7 per cent, as against 5.4 per cent CAGR of GDP during the same period. Per capita commercial energy consumption is abysmally low at 248 kilogram of oil equivalent (kgoe) as compared to the world average of 1433 kgoe, and is only 3 per cent the per capita consumption in the USA (WDR, 1997).

Since Independence in 1947, development of the energy sector in India has been dominated by public investment and management. From the Sixth to the Eighth Five Year Plans, budgetary support for this sector was in the range of 27–30 per cent of the total plan outlay. While too much protection has made public sector energy companies reluctant to improve their efficiency, intervention in the form of subsidy has encouraged inefficient and wasteful use of energy sources. Most of the energy companies are making huge losses. For example, the actual average rate of return of state electricity boards (SEBs) has fallen drastically over the years, standing at –17.6 per cent in 1997–8.

Given the prospects of high economic growth, a large population which is still growing, and very low per capita energy consumption, appetite for energy in this country is very high (see Table 8.1).

TABLE 8.1
Projected Demand of Different Energy Sources

Energy source	Unit	1996–7 (actual supply)	2001–2	2010–11
Coal	mt	299.0	386.0	628.0
Petroleum products	mt	79.0	119.0	197.0
Natural gas	bcm	22.7	36.6	61.3
Electricity	billion kWh	394.0	605.0	988.0

Note: mt—Million tonnes, bcm—billion cubic meters
Source: TERI, 1995; 1998.

India meets nearly 25 per cent of its total energy needs through import. The challenge is to ensure adequate supply of energy at the least possible cost. Although growth of the energy sector is moderate and it has served the country's social needs to some extent, it has put tremendous pressure on the government's budget.

India's fuel policy has sought to meet many objectives. In the process many inconsistencies have been introduced and the result has been counter-productive. For example, a single price prevails all over the country for an oil product through freight equalization but coal price is not equalized. Petrol is taxed heavily compared to diesel, which may be justified if one wants to discourage use of private motor vehicles, but uncontrolled proliferation of diesel cars defeats the purpose. In general, inter-fuel policy has seemed to follow little economic logic.

In the late 1990s, it was recognized that the state-owned energy companies, many of them being in the red, were neither in a position to generate the huge amount of resources needed to meet the country's energy demands internally nor would they be able to tap the domestic capital market. Mobilization of resources from the private sector became imperative, which called for a different policy environment and reforms.

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[1] These fuels have increasingly become quite commercial but the term 'non-commercial' is quite established and we use it here too.

The Government of India initiated energy sector reforms in 1991 with the objectives of

- mobilization of resources;
- achieving efficiency through competition;
- providing assured energy supply and better service to the consumer.

Some of the measures taken on those lines include private sector participation in power generation, coal mining, oil and gas production and refining, and reorientation of the organizational structure and energy policies. This chapter deals with some of these recent developments in the coal, oil, and gas sectors.

COAL INDUSTRY IN INDIA

Present Status

India has total coal reserves of about 206 billion tonnes (bt) with the following important characteristics:

- seventy per cent of the reserves are located in the three states of the eastern region (Bihar, West Bengal, and Orissa) and 20 per cent in Madhya Pradesh of the western region;
- coking coal reserves constitute only 15 per cent of the total reserves;
- only 12 per cent of non-coking coal reserves are of superior grade, the rest being of inferior grade with high ash content and low calorific value.

Lignite reserves in the country have been estimated at around 28 bt, of which 26 bt are in Tamil Nadu and Pondicherry, and the rest are in Gujarat, Rajashthan, and Jammu & Kashmir.

Coal contributed nearly 58 per cent of India's total commercial energy supply in 1996–7. Consumption was 299 million tonnes (mt) in 1996–7, as against domestic production (coal and lignite) of 286 mt. Nearly 10 mt of coal, which was mostly coking coal and used for steel manufacturing, was imported in the same year. The power sector consumed around 200 mt, which was nearly 70 per cent of total consumption. The rest was mainly consumed by the industrial sector with the steel industry being the second largest consumer with a share of 13 per cent in total consumption. Coal consumption in the power sector has registered a CGAR of 9.8 per cent during 1990–6.

Till 1972, the private sector played a pivotal role in coal production. Mining activity was characterized by a large number of small sized mines under private ownership. Most of the mining companies followed unscientific mining methods and did not pay much attention to safety regulations, and monitoring of production, distribution and pricing. Laxity on the part of the government in the form of undervaluation of coal without distinction between the economic values of coking and non-coking coals, the practice of least average cost as a basis for pricing, and lack of price incentives for mechanization led to the collapse of this industry. It encouraged the growth of fragmented smaller units (with low depreciation costs but higher profits) (Kadekodi, 1988). However, the government realized the gravity of the problem prior to the first energy crisis, since it became difficult to meet the increasing coal demand from small mines. Also there was pressure from trade unions asking for protection of coalmine workers (Kadekodi, 1988). The government nationalized the coking coalmines in May 1972 and, subsequently, non-coking coalmines in 1973.

Since 1975, the state-owned company Coal India Ltd. (CIL) and its subsidiaries have been the major producers of coal, contributing nearly 88 per cent of total production. CIL is also responsible for the marketing of coal throughout the country. The Standing Linkage Committee allots coal to the power and cement sectors, whereas the coal controller distributes coking coal to the steel sector. For other sectors, there is no control on distribution. A consumer requiring coal can approach the Central Marketing Organization, which has up-to-date information on coal availability and books order on that basis. However, in reality, over and above delay in allotment due to the mass of paperwork and the number of personnel involved, strong mafia holdings in the coalmine area cause great difficulty to the consumer in coal off-take. The major changes noticeable since nationalization during the period 1972–96, are:

- production has increased from 56.9 mt to 299 mt;
- mine productivity (CIL) (measured in output per manshift) has increased from 0.58 tonne (t) to 1.9 t;
- total employment (in number of persons) has increased from 410,000 to 670,000;
- production through open cast mining has increased from 19.80 mt in 1973–4 to 225 mt in 1996–7, whereas the contribution of underground mining has grown from 58.4 mt to 74 mt during the same period.

The average unit cost of production of CIL and its subsidiaries for 1994–5 was Rs 380/t one of the lowest amongst coal producing countries.(CMIE, 1996). The cost of underground mining is nearly three to four times higher than that of open cast mining, largely because of labour intensity and higher maintenance costs.

The Ninth Plan Working Group for coal has estimated a demand of 405 mt and production of 360 mt in the terminal year 2001–2 of the Ninth FiveYear Plan. This gap of 45 mt could only be bridged if the private sector would invest in coalmining. The investment requirement for augmenting domestic production, as estimated by the Planning Commission, will be over Rs 20,000 crore.

Problems in the Coal Industry

Quality

The majority of coal reserves in India are of inferior quality with high ash content and low calorific value. The share of low quality coal in total coal production has sharply increased (Figure 8.1). Increasing use of open cast mining has over time further raised the ash content in coal, which is as high as 40 per cent in certain mines.

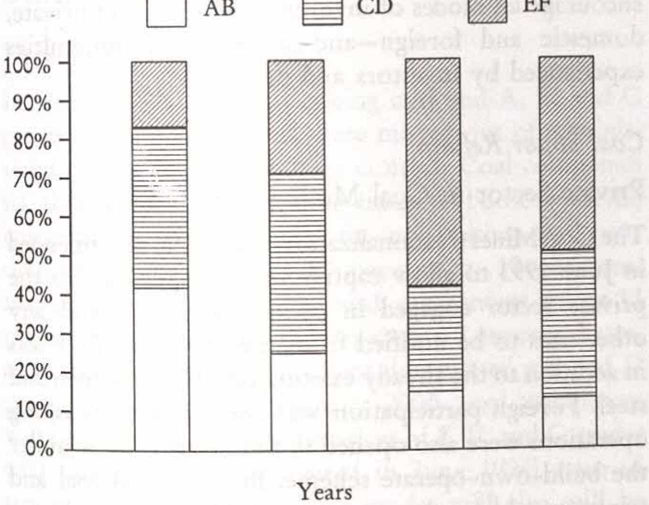

Figure 8.1 Grade Mix of Non-coking Coal Production (in per cent)

At present, twenty washeries with a total capacity of 27 mt are fully engaged in coking coal beneficiation. The overall performance of these washeries is far from satisfactory. Capacity utilization has consistently remained below 45 per cent. The ash content in the washed coal in some of the washeries is higher than the stipulated 17 per cent required to produce metallurgical coke in steel plants. This has led steel manufacturing companies to blend good quality imported coking coal with the domestic one to obtain the stipulated quality, which causes an outflow of large amounts of foreign exchange.

Large quantities of unwashed coal (with ash content in the range of 35–40 per cent) are being transported to the power stations, leading to severe constraints on the country's bulk freight services capacity and problems of fly ash disposal. Need for beneficiation of non-coking coal has been recognized since the mid-1980s. However, the long-term target of the construction of around 60 mt per annum (mtpa) washing capacity for non-coking coal has never materialized. Recently, the government has permitted private sector participation in coal washing. The private sector has undertaken to fund the construction of 20.7 mtpa of non-coking coal washing capacity under four build-own-operate projects in the states of Orissa, Madhya Pradesh, and Maharashtra.

The Ministry of Environment and Forests (MOEF) issued a Gazette Notification dated 19 September 1997, ensuring clean coal supply to all power plants located beyond 1000 km of the coalfields. All new power generation capacity constructed after June 2000 will be designed for coal with 34 per cent ash.

Transportation

With much of the coal production concentrated in the eastern part of the country, and power stations and steel and cement plants located elsewhere, transport becomes a major consideration. Nearly 62 per cent of Indian coal is transported by rail. About 16 per cent is transported by merry-go-round (MGR), a dedicated rail transport system for pithead power plants, 18 per cent by road, and the balance by coastal shipping, aerial ropeways, etc.

Coal movement accounts for nearly 50 per cent of the total freight traffic of Indian Railways. It always gets top priority in the plan formulation of Indian Railways. Railways does a remarkable job in terms of moving nearly 200 mt coal at present. However, there are transport bottlenecks which are probably due to shortage of wagons, limited line capacity, or operational inefficiency at some points. These cause erratic supply/unavailability of coal at various consuming centres, and also accumulation of stocks at the pithead. Also, in terms of reliability/efficiency and security of operation, Indian Railways is not very impressive, primarily because of the pilferage of coal, the large number of personnel involved, and the long delays occuring at railway terminals. This has caused a shift towards road to transport coal, which is uneconomic and energy intensive, but being operated by the private sector more reliable and efficient in terms of delivery.

The rapid increase in demand for coal, especially by the power and steel sectors has necessitated an integrated coal transportation policy, which has encouraged the development of MGR systems and inter-modal (rail-cum-sea) movement of coal. Other measures that have been taken are:

- setting up of super thermal power stations at pithead;
- identification of critical rail links in the coalfields for priority development.

Also, the GOI has introduced an 'own your own wagon scheme' for the private sector. Recently, one private power project at Vizag has decided to procure wagons worth Rs 150 crores and lease them to the Railways.

Productivity

During the period 1965–96, average productivity has increased significantly from 0.65 t per manshift to 1.9 t. This improvement can be attributed to increasing use of open cast mining. Productivity of open cast mining has increased from 0.9 t to 5.1 t, while it remains stagnant at around 0.6 t for underground mining. However, productivity of the Indian coal industry is much lower than comparable figures abroad. For example, in Australia, the figures were 14.9 t and 30.6 t respectively for underground and open cast mining in 1990–1. In the US, these figures are 19.3 t and 47.7 t respectively. One of the major constraints on the profitability of the coal sector is the low productivity in underground mines. Despite massive investments and despite employing 80 per cent of the manpower, it contributes only 25 per cent to total production.

Pricing

Till recently, the pithead price of all grades of coal was fixed by a normative cost-plus approach adopted by the Bureau of Industrial Costs and Prices (BICP). The costs were based on normative rather than actual levels of efficiency. A weighted average price was recommended on the basis of estimates from different samples of mines based on their geological and other characteristics. The normative levels were expected to provide incentives to improve efficiency. However, the coal industry neither achieved these normative levels of efficiency nor the projected mix of production of different grades of coal. For example, the share of EF grade coal in total non-coking coal production has increased from 18 to almost 50 per cent during the period 1980–94 (Figure 8.1). Besides, quite often there have also been long time gaps between the date of actual revision of price and increase in input costs. The increases did not always fully reflect all the components of cost escalation. As a result, since 1973–4 the price of coal has almost consistently remained lower than the average cost of production, resulting in deterioration of the financial health of the national coal companies over time. (However, in view of mounting losses of coal companies, coal prices have been set above the cost of production since 1991–2).

Excessive manpower and low productivity have further aggravated the problem. Moreover, for a public sector company, profit was irrelevant and did not provide any incentive to increase efficiency. Since competition was totally absent, the companies had no incentive to reduce costs.

Thus the pricing mechanism, absence of a competitive market, and the structure of the coal industry have led to financial problems of coal companies and a certain degree of inefficiency. In this situation, the prospect of infusion of private enterprise and capital for coal development does not appear to be bright. It was recognized that future policy initiatives should be directed towards proper coal pricing through creating a competitive market. In addition, it should also induce and increase efficiency through compulsions of market forces rather than through administrative controls or prescriptions.

With the objective of bridging the demand–supply gap, the GOI has taken several measures on pricing and deregulation of the coal industry to improve the competitiveness and efficiency of existing companies, encourage all modes of investment—public and private, domestic and foreign—and mitigate the difficulties experienced by investors and developers.

Coal Sector Reform

Private Sector in Coal Mining

The Coal Mines (Nationalization) Act, 1973, was amended in June 1993 to allow captive mining operation to the private sector engaged in power generation and any other uses to be notified from time to time. This was in addition to the already existing provision for iron and steel. Foreign participation was also allowed. Washing operations were also opened to the private sector under the build–own–operate scheme. Both washed coal and rejects would be the property of CIL. The washeries might charge Rs 100–Rs 200/t of washed coal.

The captive mining system failed to enhance coal output as anticipated, mainly due to a number of restrictions imposed on private developers and the numerous clearances required from the various government agencies. In particular, it did not permit the captive producer to sell surplus coal in the open market. Under these conditions, banks and financial institutions were unwilling to extend loan even to promoters of power plants who were given clearances for captive coal mining. They feared that the power developers would transfer funds to coalmining, which they considered an unprofitable venture. In addition, many of the coal blocks offered were not rich enough to become economically viable projects. At the same time, imports of non-coking coal were allowed under the open general licence (OGL) with a substantial reduction in customs duty making imported coal cheaper, particularly in the coastal areas.

On 11 February 1997, the Union Cabinet Committee announced a major policy reform for the coal sector. The highlights of the policy are:

- coal mining has been opened to private companies not only for captive consumption but also for sale;
- foreign equity is allowed in domestic coal companies;
- an independent body will be set up to oversee exploration and allocate blocks on the basis of competitive bidding;
- a regulatory body will be set up to arbitrate price disputes.

To make coal easily available to consumers across the country, CIL announced the 'Tatkal Liberalized Coal Sales Scheme' which cuts down all procedural formalities of linkage, allotment, and sponsorship. The scheme was initially applicable at Central Coalfields Ltd. and Bharat Coking Coal Ltd..

Decontrol of Coal Prices

In March 1996, prices of coking coal and A, B, and C grades of non-coking coal were moved out of administered pricing and distribution control. Coal companies fix their prices. At the same time, to boost domestic competition, import duty on non-coking coal was drastically reduced from 80 per cent to 10 per cent. Import duty on coking coal with ash content below 12 per cent was reduced from 5 per cent to 3 per cent. Later, in March 1997, the government deregulated price of D grade coal. Also, till January 2000, coal companies will be allowed to revise the prices of E, F, and G grades coal (which were last revised in June 1994) once in six months. After that, these grades will also will be deregulated.

In 1996–7, the first year of partial decontrol of coal prices, CIL made a pre-tax profit of Rs 1137 crore, 86 per cent higher than the previous year and for the first time paid a dividend of Rs 96 crore to the government. The increase in average pithead prices of deregulated varieties of coal (coking coal, A,B, C grades non-coking coal) was 25.27 per cent. In April 1997, CIL revised the prices of other varieties of coal by about 30 per cent.

The reduction in import duties on non-coking coal has introduced some competition in the domestic coal market. The import of coal has increased from 14 mt in 1996–7 to 26 mt in 1997–8, leading to significant growth in stockpiles at the pithead. Traditionally India imports coking coal for steel plants. However, this growth in imports is due to non-coking coal, consumed primarily by power plants. It is most likely that coastal power plants have been using imported fuel. The reduction in customs duty makes imported coal cheaper than domestic coal around the ports. Reportedly, the landed cost of Indonesian coal at Chennai port is Rs 286/ million kilo calories, whereas the cost of coal in the same location originated from the eastern coalfields is Rs 381/ million kilo calories.

Some Suggestions

Despite several environmental and other hazards associated with the use of domestic coal, India cannot do without using it. At least for sometime, domestic coal will play a dominant role due to the following reasons:

- coal reserves are abundant and enough for another 200 years;
- it is the cheapest source of fuel;
- if we do not use domestic coal, we will have to import fuel, as our reserves of oil and gas are not very large. Dependence on imported fuel alone will put tremendous pressure on foreign exchange as well as pose a great threat to our energy security;
- there are a large number of unresolved issues involved in exploiting hydro and nuclear potential.

The measures taken towards creating a competitive and efficient market for coal are expected to attract investment in mining and production. However, to strengthen the domestic coal industry and to promote use of coal as an environmentally acceptable fuel in the country, the following steps will be useful:

- Clean coal technologies like Integrated Gasification Combined Cycle (IGCC), Pressurized Fluidized Bed Combustion (PFBC) should be adopted for power generation. Having thermal efficiency higher than conventional pulverized coal based power generation technology by an order of 15–20 per cent, adoption of IGCC/PFBC technology will reduce the problem of fly ash disposal, transportation requirement, and environmental hazards at local as well as global level. Cost of power generation in the eastern region based on IGCC technology has been estimated for 1996–7as Rs 3.17/kWh using domestic coal, as against Rs 3.41/ kWh for fuel oil. A policy in terms of financial/fiscal incentives is necessary to encourage the private or joint sector to invest on importing these technologies which are already commercialized.

- A number of studies indicated that pithead generation combined with the transmission of power is cheaper than generation at load centers with long distance rail transportation. Apart from economic benefit, power generation capacity at pithead reduces transportation requirement as well as environmental hazards. In the past, a large number of super thermal power stations under state ownership have been installed. The government's recent policy decision on encouraging private sector to setting up mega projects at pithead is a welcome initiative in this regard.
- Use of pressurized fluidized boiler for industrial process heating needs to be encouraged. This type of boiler can not only accept coal with higher ash content but also offers higher efficiency of fuel use and subsequently reduces environmental problems.
- Given the high ash content of Indian coal, beneficiation will reduce the transportation need as well as the ash disposal problem. The government's present policy on coal washeries is not very attractive to the private sector and needs to be revised.
- Coal transportation has become a major constraint. Coal gasification and pipeline transportation should be promoted as an efficient and clean mode of supply as well as use. As in the hydrocarbon sector, private sector participation should be encouraged in case of pipeline transportation of coal. A committee established by the Ministry of Petroleum and Natural Gas (MPNG) compared the landfall price per million kilo calories (mkcal) of gas from different sources, and concluded that underground coal gasification is one of the cheapest alternatives. It costs US$ 5.95–9.92 per mkcal as compared to the price of piped gas from Oman or Iran at US$ 9.52 per mkcal or of liquefied natural gas (LNG) at US$ 13.89 (ET, 1997b).
- The process related to supply linkages needs to be simplified and made flexible. A study on existing power plants and coal linkages carried out by the IGIDR showed that even with the existing coal production capacity, transportation and infrastructure costs can be reduced by optimizing coal linkages (Chattopadhyay and Parikh, 1997).

PETROLEUM

Present Status

At present, petroleum products account for about 30 per cent of the primary commercial energy supply. The CAGR for consumption was 6.1 per cent during 1985–97. A similar or even higher growth rate in demand is expected in the coming decades resulting from economic growth, population growth, unavailability of traditional fuels, increase in disposable household income, and environmental factors.

Government-owned enterprises dominate the Indian petroleum industry. The Oil and Natural Gas Corporation Ltd (ONGC) and Oil India Ltd (OIL) are involved in upstream activities such as exploration and production (E & P). Downstream activities like refining, marketing, and distribution are entrusted to Indian Oil Corporation (IOC), Bharat Petroleum Company Ltd (BPCL), Hindusthan Petroleum Company Ltd (HPCL), etc. The first joint venture refinery capacity of 3 mt at Managalore has started production in 1996–7.

Crude production after reaching a peak of 33.7 mt in 1989, declined to 27 mt in 1993–4. However, it has gone up to 33.8 mt in 1997–8, out of which joint venture/private producers' contribution was a mere 0.25 mt. The flogging of oil fields for many years in succession without timely water injection has led to extensive damage and closure of several wells in the Bombay High basin. However, a well rectification programme has arrested the downfall in crude production.

In 1997–8, refinery crude throughput was 65.1 mt and production of petroleum products was 61.1 mt. The total refining capacity of fourteen refineries in operation as on March 1998 was 61.55 mtpa and is expected to go up to 131 mt by the year 2001–2. This includes addition in refining capacity in public sector, joint venture and private sector units, and expansion of all existing refineries. Capacity utilization has been consistently above 100 per cent in recent years.

The consumption of petroleum products was 83 mt in 1996–7 (TERI, 1998). The transportation sector was the largest consumer, accounting for 38 per cent of total consumption, followed by the domestic sector (26 per cent) and the industrial sector (24 per cent). Diesel consumption was 35 mt, nearly 9.4 per cent higher than the previous year. LPG (liquefied petroleum gas) consumption (4.2 mt) registered the highest growth of 10 per cent over the previous year. Kerosene and LPG are consumed primarily by the domestic sector and are heavily subsidized. LPG connections are released to consumers through public sector oil companies, whereas kerosene is sold through the public distribution system. As on March 1995, 11.7 million persons of those who had applied for LPG connections were on the waiting list. To augment domestic supply of LPG and kerosene, the government introduced a parallel marketing system. Imports of these products were decanalized. Private companies were allowed to import and sell these products in the domestic market through their own network at market-determined prices. However, this effort was not very successful due to lack of infrastructure facilities and duty structures.

About 34.5 mt of crude oil and 22 mt of petroleum products were imported in 1997–8 (CMIE, 1998a). Import dependence in oil and oil products has grown from 54 per cent in 1990–1 to 67 per cent in 1997–8 and is a serious cause of concern for the government.

The import bill for petroleum and oil products was $8.4 billion in 1997–8, nearly 30 per cent of the export earning. This is despite low international prices of crude/petroleum products throughout the year, which led to a 13 per cent decline in the import bill over the previous year.

There are separate pipelines for crude oil and products. Existing pipelines for crude oil have a total length of 3005 km and an installed capacity of 72.3 mt. Of this, the ONGC owns a length of 592 km with a capacity of 31.75 mt, OIL owns 1194 km with a capacity of 20.55 mt, and rest is owned by the IOC. The existing product pipeline has a total length of 4235 km with a capacity of 18.55 mt and is mostly owned by the IOC. Currently, Indian Railways is handling the bulk of petroleum products movement followed by transportation by pipelines. A combination of shipping and railway transportation is used for the movement of products from coastal refineries.

Problems in the Petroleum Industry

Exploration and Production

Indian sedimentary basins cover 1.78 million sq. km, of which 1.46 million sq. km is onshore and the remaining is offshore (TERI, 1998). India continues to be one of the least explored regions. Of the 26 sedimentary basins, only 6 have so far been explored, accounting for only 30 per cent of the country's prognosticated reserves. Capital constraints have limited exploration activity in India leading to low reserve accretions in the past years. India's balance recoverable crude oil reserves are declining continuously after peaking at 806 mt in 1992. This indicates the need for greater exploration efforts. However, this will require substantial investment in the range of a few thousand crore per annum for the exploratory work and even larger amounts for development and exploitation once discoveries are made. The problems in terms of E & P are as follows:

- Reserve accretion has been small. Only about 518 mt of in-place reserves have accrued in the first four years of the Eighth Plan, a large part of which has been in small and marginal fields.
- No major headways have been made in overseas E & P ventures.
- Huge venture capital to the tune of Rs 180,000 crore needs to be mobilized in the E & P sector.

Supply of Crude Oil

By the turn of the century, production from the existing fields will stabilize at about 40–4 mt (R-Group, 1996). If there are no new discoveries and the projected demand of 197 mt in 2010 is to be met through imports, the import bill could be of the order of US$ 26 billion per year (R-Group, 1996). The economy would be hard pressed to pay the bill unless our exports do much better than at present. Thus we need to increase indigenous production or supplies from equity oil so that we may be able to establish in other countries.

Refining

Very often the refinery product mix does not match the demand mix for petroleum products. Apart from demand management, technology needs to be adopted for new refineries such that the product mix can be adjusted to market needs (Rao, 1998). Furthermore, in view of the current environmental standards, the harmful chemical content such as of lead, benzene, and sulphur needs to be reduced. For the production of green fuels the cost of upgradation of existing refineries has been estimated at Rs 6500 crore.

Transportation Infrastructure

There is considerable scope for improving the energy efficiency of the petroleum product transportation system. Although rail movement has the advantage of using existing track capacity, pipelines transportation is more energy efficient; environmentally friendly; leads to negligible product losses; and brings down inventory cost. On the whole, the cost of long distance products movement through pipelines is one-tenth that of railway transportation. Land costs are minimal (pipelines are laid underground); it is also possible to traverse through difficult terrain. Therefore, greater emphasis needs to be laid on developing pipelines as the primary mode of inland movement of petroleum products.

The present transportation infrastructure is inadequate to meet the growing demand for petroleum products. The new refining capacity needs to be supported by crude pipelines to supply crude to refineries and products pipelines to transport petroleum product to demand centres. An Oil Industry Working Group has recommended fourteen new pipelines by 2005. To expand existing pipelines and implement the new pipelines, the investment requirement is of the order of Rs 5000 crore. Recently established, Petronet India, a holding company (floated jointly by public sector companies like IOC, BPCL, ONGC), has the responsibility of raising the finances for the planned projects.

Considering that currently about 65 per cent of the demand is met by imports in the form of crude and petroleum products, and that this figure is likely to increase in future, it is of utmost importance that the current constraints on port facilities be overcome.

Pricing

Till 1997–8, a cost-plus pricing regime was accepted. The entire oil industry had been operating under total regulation through an administered pricing mechanism (APM). However, from April 1998, the production and refining segments were removed from the control of APM. Till 1997–8, prices for oil producing and refining companies were decided in the following manner:

- ONGC and OIL were compensated for their operating expenses with a 15 per cent post tax return on the capital employed. Import of crude oil and petroleum products was fully canalized through the government-owned IOC and controlled by the Empowered Standing Committee of the GOI.
- Refining companies were provided crude oil at a fixed price, which had no relation to domestic/world crude oil prices (See FOB pooled price in Box 1). The retention price that was paid to the refineries took into account the delivered cost of crude (as a weighted average of the indigenous and imported crude price), other operating expenses, and 12 per cent post tax return on the capital employed. Standards were laid down for each refinery in respect of throughput level, product pattern, fuel loss, operating cost, and capital employed.

For the distribution and marketing of refinery products, prices are still fixed under a cost-plus formula, wherein marketing and distribution costs are fully compensated and a post tax return of 12 per cent is guaranteed on investment. The ex-refinery price of a product is the price at which the product is sold to marketing companies. Under the APM regime, it was calculated by taking the weighted average of retention prices of a particular product of all refineries. Marketing costs and profits (referred to as marketing margins) are also estimated taking into account the norms fixed for marketing operations. Marketing margins are averaged out to compute industry margins for inclusion in the selling price. The market shares of individual PSU oil companies are controlled through SPE (sales plan entitlement), which has provisions for penalties on exceeding the specified sales volumes.

At distributor level, till date, the dealer's commission rate is uniform and regulated by the government. The selling price of products to the consumer includes in addition to industry average costs and profits, notional railway freight, retailing cost, various surcharges, and government levies. Irrespective of the company marketing the product and the location from which the product is actually supplied, prices of products at a location are maintained at a uniform level.

The ex-storage price does not include excise tax, dealer's commission, and local taxes. As far as consumer price is concerned, socially sensitive domestic consumption products like kerosene, LPG, and diesel used for agriculture and mass transportation are heavily subsidized. Furnace oil, or naphtha used for fertilizer manufacturing are also subsidized. Subsidies are non-transparent as they are financed not by direct budgetary support but by cross-subsidization through an oil pool account. Prices of gasoline, ATF, and fuels like furnace oil, diesel oil, and naphtha used in the industry other than fertilizer are kept higher than the cost of production to balance the under recoveries on subsidized products. The difference between the built-up prices (ex-refinery price + marketing margin + surcharges) and ex-storage prices, known as product price adjustment (PPA), is used to allocate subsidies and cross-subsides on products. Note that during the total control regime, an increase in price implied a hike in PPA and thus had an impact on the ex-storage point price and not on the ex-refinery price (Table 8.2). Since retention prices were untouched there was no major effect on oil companies. Excise duties and local taxes are added on to the ex-storage point price to arrive at consumer price.

Table 8.2
PPA for Gasoline and MS before and after Price Hike on 2 July 1996

	Gasoline		Kerosene	
	Pre-July 1996	Post-July 1996	Pre-July 1996	Post-July 1996
Ex-refinery price	1695	1695	1956	1956
Marketing margin	159	159	119	119
Surcharges	680	680	680	680
Total build-up	2534	2534	2756	2756
Product price adjustment	10,311	13,522	(754)	(754)
Ex-storage point price	12,844	16,055	2001	2001

Source: Sachs, Aithal, and Prasad, 1997.

The entire administered pricing system was operated through an oil pool account maintained by the Oil Coordination Committee (OCC), wherein inflows and outflows of the pool account were to be kept in balance to provide uniform and stable prices throughout the country. Companies either used to surrender or withdraw from the oil pool account. Weekly settlements were made between oil companies and the oil pool account. The inflow to the oil pool account was from the collection of surcharges on the sale of petroleum products, while the outflow was for meeting the variations in the element of the standard costs. Though the number of pool accounts is more than fifty, the major pool accounts in which the oil companies adjust their claims and surrenders are:

- crude oil price equalization account (COPE)
- cost & freight (C & F) adjustment account
- freight surcharge pool (FSP) account
- product price adjustment account

A description of the functioning of each of these accounts is given in Box 1. A deficit would primarily occur when:

Box 1

Functioning of Different Pool Accounts

Crude Oil Price Equalization (COPE) Account

The refineries paid the pooled FOB price for crude oil, which was fixed at Rs 1700/tonne in 1986 and has never been reivsed. The purpose of COPE account was to allocate crude oil (received from various sources, both imported and indigenous) to the refineries at uniform price. If a refinery paid a higher price than the pooled FOB price, the difference will be reimbursed by the COPE account. Similarly, the refineries obtaining crude at a lower price would contribute the difference to the account.

These transactions in COPE account should broadly balance each other. However, *as the pooled price was a pre-determined price fixed in the past (with reference to the then prevailing prices) and not the weighted average of domestic and CIF prices of crude procured in the current year, there were bound to be some imbalances in this account.* The deficit increases if international/domestic price of crude increases, the rupee depreciates against the dollar, the domestic supply of crude falls. During 1987–94, this account has always been in deficit which has increased to Rs 9876 crore in 1994 (CMIE, 1995).

Cost and Freight Adjustment (C & F) Account

This account comprises a number of sub-pool accounts. Some of the important ones are the following:

- Oil companies imported petroleum products at a price higher than the ex-refinery price. The difference is compensated from this account. Similarly, they were reimbursed for naphtha exported at prices lower than the retention prices.
- The difference between the cost of bringing the crude oil to the refineries and the cost built in the retention prices of refineries is reimbursed from the C & F account. The reimbursement went up from Rs 1206 crore in 1987–8 to Rs 2914 crore in 1994–5.
- During 1991–2, the pool absorbed exchange variation of Rs 2214 crore on loan that the IOC took on behalf of the government to finance oil import.

The C & F surcharge, which was fixed at Rs 640/selling unit since 1986, has never been revised. The deficit in this account has gone up from Rs 391 crore to Rs 6936 crore during 1989–94 (CMIE, 1995).

Freight & Surcharge Pool (FSP) Account

This account adjusts the additional costs of transportation on account of authorized out of zone movements and coastal movements of petroleum products. The FSP surcharge built in the product prices remained unchanged at Rs 40 per selling unit since 1986. However, the deficit in this account has increased substantially due to the following reasons:

- The notional railway freight built in the depot prices is based on the freight rates on December 1986. Subsequent increases in railway freight have not been passed on in prices. The underrecovery has been reimbursed to the oil companies from this account.
- A similar thing has been happened in the case of coastal shipping as well.

Product Price Adjustment Account

Product price adjustment has been defined earlier. This account has always generated surplus due to increases in petroleum products prices from time to time (which are basically *increases in cross-subsidy* and surcharges levied on some products as can be seen from the Table 8.3). The surplus mounted from Rs 12 crore in 1987–8 to Rs 19,886 crore in 1994–5 (CMIE, 1995) and significantly compensated the deficits arising from other accounts. *Thus, although the pooled FOB cost of crude oil, ex-refinery prices as well as C&F and FSP surcharges have never been revised, the increase in the cost of manufacturing and distribution of petroleum products has been predominantly recovered through the product price adjustment and surcharges under this account.*

- domestic crude production falls so that the country would have to import more crude at much higher prices;
- international prices rise, which increase both crude and finished products import bills;
- the rupee depreciates against the dollar, leading to an increase in the import bill in rupee terms;
- supply from domestic refineries lags demand, which increases import of finished products.

These events in 1996–7 led to an oil pool deficit totalling Rs 15,500 crore in March 1997. Increasing receivables from the pool account led oil companies to go in for excessive borrowings. Reportedly, this raised the debt–equity ratio from less than 0.5:1 to 2:1. Under the present partial decontrol regime, the oil pool accounting system still exists. Due to drastically low international price throughout 1998–9, the oil pool account is expected to generate a surplus of Rs 17,000 crore in this year.

Under the APM, marketing companies, refineries, and oil producers were fully insulated from international price fluctuations and their market shares were fully protected. Although the APM has worked satisfactorily to fulfil social needs and helped public sector oil companies to grow under a protected environment, it has several flaws:

- It cannot generate adequate financial resources for investment in the upstream and the downstream sectors.
- Sometimes it creates a deficit in the oil pool account that makes PSUs unviable with the accumulated outstandings. More importantly, while waiting for the mounting receivables, oil companies borrow at market rates of interest which are much higher than what they receive on their outstandings.
- The subsidies and cross-subsidies have led to serious distortions in consumer prices and do not reflect the economic cost of petroleum products. This has led to adulteration, diversion, and the consequent inefficient use of products. The low price of diesel has encouraged a significant shift from petrol to diesel driven cars. The total subsidy on diesel in 1996–7 has jumped from Rs 430 crore in 1994–5 to Rs 8340 crore in 1996–7. Consumption during 1994–6 has increased at the rate of 11.5 per cent annually, leading to import of nearly 15 mt of diesel in 1996–7. The wholesale price for kerosene has gone up by just 47 per cent during 1981–97, while for petrol the figure is more than 180 per cent. A large quantity of kerosene is diverted for use in diesel engines and power plants. The international price of LPG increased from US$ 250/t in November 1996 to US$ 307/t in January 1997. But the domestic consumer remains insulated from this price rise (around 1 mt of LPG was imported in 1996–7). The total petroleum subsidy which was Rs 18,440 crore in 1996–7, registered a 100 per cent jump over the 1995–6 level.

In addition, assured returns on the cost-plus formula do not encourage efficiency in operation of PSUs. Since all investments and costs are reimbursed, there is no incentive to make profitable investment decisions. Moreover, under the APM, oil companies can pass on any cost increase arising from international oil prices to the consumer. The R-Group estimated (1996) that improvement in operational efficiency in refineries (i.e reduction in fuel loss from the present level of 7 per cent to 5–6 per cent, lesser consumption of auxiliary fuel, and increased manpower productivity) would lead to a benefit of US$ 500 million per annum. A better product mix, more value added product, and improvement of distillate yield from the present level of 70 per cent to 80 per cent through state-of-the-art-technology upgradation and reduced capital cost will make one refinery 12 mtpa worth US$3.4 billion almost free.

In the upstream sector, the APM had inadequate incentive (since price of crude oil paid to the producer was lower than international price) to invest in risky ventures to develop oil and gas reserves.

Also, as long as the players were PSUs, the government could control investments and costs; but with the entry of private players in the market, the cost-plus formula will encourage 'gold plating' of the plant. This would add to the overall cost and consumers would ultimately have to bear the increase. Moreover, with the entry of private players in the market, it will become increasingly difficult to efficiently administer the APM and ensure a level playing field. To secure oil supplies to meet future demand it therefore became necessary to move towards a market driven price mechanism. Once prices are deregulated, refineries will be allowed to stipulate the refinery gate price of petroleum products which will compete with imported products.

Reforms in the Petroleum Industry

The Private Sector in Exploration and Production

The MPNG recognizes that the efforts of the two national oil comapnies (NOCs) need to be supplemented by additional investments in E & P by multinational and Indian companies. Since 1974, nine rounds of bidding on offering blocks for exploration have taken place. Acreage was offered in a production sharing contractual (PSC) system wherein private companies would enter into production sharing arrangements with the NOCs. However, in the last few years, neither the multinationals nor the NOCs have had much success. This may be because of the mediocre quality of the offered exploration blocks, procedural delays due to the involvement of a large number of government agencies, and the unduly long time taken to finalize exploration bidding rounds and allotment of contracts.

Much more aggressive efforts are needed to earn greater confidence of the private sector and to attract a higher level of investment. Moreover, the entire large sum of capital required for exploration would be in the form of risk capital. No lending agency would be in a position to support such activities, unless attractive fiscal incentives were provided to cover the risk. An investor friendly package has been recently offered by the government.

The highlights of the package are:

(i) geological data are to be made available to companies to enable them to evaluate the prospects of blocks on offer;

(ii) attractive fiscal terms which are globally comparable are to be offered;

(iii) discovered fields are to be offered for development under the JV/private sector arrangements for speedy augmentation in the production of oil and gas.

To promote efficiency and greater competition in the exploration of oil and gas, a new exploration licensing policy has recently been adopted. The main thrusts are summarized as follows:

- NOCs to compete for obtaining petroleum exploration licences,
- level playing field to the NOCs on prices and fiscal regime,
- infusion of new ideas and innovative technologies by encouraging participation of more players,
- a fiscal package which ensures adequate return to the investors,
- hundred per cent private participation,
- freedom to companies to market the discovered crude oil and gas from the new blocks in the domestic market.

The Dismantling of the APM

On 21 November 1997, the government announced complete dismantling of the APM in a phased manner over the period 1998–2001, beginning 1 April 1998.

The highlights of the policy are as follows:

- Oil producers (ONGC and OIL) will be given 75 per cent and 77.5 per cent of the weighted FOB price of actual imports for 1998–9 and 1999–2000 respectively. This will be gradually increased to 100 per cent by 2002. However, considering the possibility that international prices may move below $12/barrel, the government has introduced a floor price of Rs 1991/t of crude.
- The retention pricing concept would be abolished for refineries from 1 April 1998. Prices for controlled products would be fixed at adjusted import parity prices.
- MS, HSD, Kerosene, ATF, and LPG will continue to be controlled during the transition period. Some subsidy on LPG will be retained and borne by the oil companies, while subsidy on kerosene will be borne by the General Budget.
- The prices of the decontrolled petroleum products, naphtha, furnace oil, LSHS, LDO, and bitumen, will be market driven and suitably adjusted to reflect the prevailing market conditions.
- Crude oil and all petro products except gasoline, aviation turbine fuel (ATF), natural gas liquid (NGL), and HSD will be decanalized.
- Private companies investing more than Rs 2000 crore in a refinery or private oil producing companies producing at least 3 mt would be given marketing rights.
- Import duty on crude oil was reduced from 27 per cent to 22 per cent in 1998–9 and would be brought down to 0–5 per cent by 2001–2. Duties on products (excepting LPG and kerosene) would be brought down to 15 per cent from the existing rate of 32 per cent.

The exact effect of decontrol on each refinery would depend on a number of factors such as location of the refinery, product mix, and product-wise import duty. However, the revised duty structure provides a 21 per cent effective protection to the refineries during the transition period. Internationally, the prevailing protection rate ranges between 5 and 10 per cent. Such high protection will defeat the primary goal of efficiency improvement and competition. A fresh look is needed at this decision.

During April–August 1998, prices of decontrolled products like naphtha, bitumen, furnace oil, and LSHS were revised twice and were reduced by 8 per cent, due to a consistent fall in international prices of crude and petroleum products. Consumers have been benefited by Rs 2300 crore. Net profits of the BPCL and IOC have gone up by 242 per cent and 105 per cent respectively during the first quarter of 1998–9.

Some Suggestions

Efforts should be made to acquire acreage abroad and to add to the country's equity reserves. India possesses the competence, manpower, and service industry. ONGC has taken a step in this direction. ONGC Videsh Ltd.

(OVL), a wholly owned subsidiary, which has some experience abroad, carries out the overseas activities of ONGC. OVL has a PSC in Vietnam, jointly with British Petroleum and State Oil where it has discovered about 2 trillion cubic feet (tcf) of gas reserves. However, much more energetic efforts are required in this area and the NOCs and the Indian private sector need substantial support from the government in terms of policy initiatives for exports. Some of them as suggested by the R-Group (1996) are as follows:

- International opportunities for equity oil are available only for a very short period—not more than one or two months. Present procedures do not allow such opportunities to be seized. An empowered committee, chaired by the Secretary (Petroleum) and having representatives from such concerned government departments as the ministries of External Affairs, Finance, and Commerce should be set up. The Committee with the MPNG as a nodal agency should act as a single window clearance agency and the decision of the committee should be binding on all including the Reserve Bank, customs, and other related agencies.
- Some incentives in the form of tax relief/exemption are also required. Domestic E & P companies may be allowed to invest their taxable income abroad.
- Custom duty exemption may be granted on import of equity oil acquired from overseas by an Indian company as against the conventional crude oil imports.
- A fund amounting to $200–300 million should be created within the Oil Industry Development Board (OIDB) to be utilized as soft loans to Indian E&P companies for acquisition of oil reserves overseas.

Existing reforms decontrol price only till refining operation. To create effective competition, the government should come up with a transparent pricing method for all segments at the earliest. Given the huge resource requirement for developing a national pipeline network, development and operation of the pipeline should be opened to the private sector.

An independent regulatory authority is required to enhance the confidence of the private sector and provide a level playing field for both private and government operators.

NATURAL GAS

Present Status

The share of natural gas in total energy supply has increased from 2 per cent in 1980 to 8 per cent in 1995. The balance recoverable reserves went up to about 707 billion cubic metres (bcm) in 1995–6 from about 411 bcm in 1980–1. From 2.35 bcm in 1980–1, production has shot up to over 24.45 bcm in 1997–8. At the current rate of production, India's recoverable reserves are expected to last for the next thirty years.

Currently, domestic demand is 32 bcm. The demand-supply gap is expected to be around 25 bcm by 2001–2 when demand will reach 51 bcm (at current prices). Allocation of gas is stipulated by the MPNG which has changed over time subject to the priority given to its use (TERI, 1998). The fertilizer and power sectors account for the largest shares in natural gas consumption.

An unfortunate aspect in respect of natural gas has been the flaring of associated gas.[2] During the period 1984–9 (the Seventh Five Year Plan period), more than 40 per cent of the total production of about 47.9 bcm of gas was flared. This was due to lower off-take than committed by customers like fertilizer plants and power stations, and inadequate evacuation facilities from the producing fields to the consuming centres. Flaring was targeted to be eliminated by 1996–7 by improved evacuation facilities and supply management.

While, ONGC and OIL are responsible for exploration and production activities, the Gas Authority of India Ltd (GAIL) has monopoly in marketing and distribution. GAIL has the responsibility of operating and maintaining the HBJ pipeline network, which traverses Madhya Pradesh, Rajasthan, and Uttar Pradesh. Recently, the pipeline has been extended till Delhi and its capacity has been enhanced from 18 million standard cubic meter per day (mmscmd) to 33 mmscmd. The British Gas Company and GAIL have formed a joint venture company called Mahanagar Gas Ltd, which has developed a pipeline network in Mumbai to distribute gas to households and commercial premises.

The GOI has approved in principle the laying of a gas pipeline from suitable points on the western coast to the southern states.

Gas Price Deregulation

Till recently, gas price was stipulated by the government and was Rs 1850/1000 cu. m plus transportation charges (Rs 860/1000 cu. m along the HBJ pipeline) and royalty. Based on parity of energy content with and CIF prices of furnace oil and naphtha, the price of gas at landfall point would be in the range of Rs 3300—Rs 5300 per 1000 cu. m as estimated by the R-Group (1996). Very low price of natural gas is one reason for its very high demand.

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[2] Associated gas originates from fields producing both liquid and gaseous hydrocarbons, while non-associated/free gas originates from fields producing only hydrocarbons in gaseous form.

Natural gas and petroleum products being substitutes of each other, the deregulation of natural gas pricing should be undertaken concurrently with the dismantling of APM of crude oil and petroleum products so as to establish rational market driven pricing for the end users. The Shankar Committee recommended a gradual increase of consumer price approaching possible import prices of LNG/natural gas over a period of five years. With effect from 1 October 1997, the consumer price of gas at landfall point has been fixed at 55 per cent of the international price of a basket of internationally traded fuel oils. In addition to these prices, the final consumer bears transportation/service charges, royalty, taxes, duties, and other statutory levies on production, transportation, and sales. The respective prices in the years 1998–9 and 1999–2000, will be 65 per cent and 75 per cent of international fuel oil price. After that the prices will be reviewed with a view to achieving 100 per cent FO price parity.

The price would be determined and notified for every quarter depending on the average prices of the basket of FOs.

Over the period 1 October 1997 to 31 March 2000, the transportation charge payable to GAIL along the HBJ pipeline would be Rs 1150/1000 cu m . This will increase by 1 per cent for every 10 per cent increase in the consumer price index. During the first quarter of 1998–9, the natural gas price was reduced from Rs 2411/1000 cu m to Rs 2271/1000 cu m, following the fall in international prices of FO.

To meet growing demand, the government is exploring other possible sources to supplement domestic supply which include import of gas from the Middle East through transcontinental pipelines or in the form of LNG, and E & P of domestic Coal Bed Methane.

Liquefied Natural Gas (LNG)

Natural gas can be transported either by pipeline in natural form or by ship in the compressed liquid form which is called liquefied natural gas (LNG).[3] Transportation costs form an important part of overall costs for long distance gas supply. Generally, gas transport through subsea pipeline from offshore is cheaper than LNG up to a distance of 1000 km from the source. This distance increases to 3000 km on land. Transport of gas in the form of LNG is economical if the markets are more than 3000 km away. Having failed to negotiate for gas import through pipeline because of technical and political reasons, import of natural gas in the form of LNG has been given serious consideration over the last two years in India.

Why Import LNG?

The use of domestic coal is becoming increasingly difficult due to quality and transportation constraints and environmental hazards.

Because of political and environment-related problems, India has been able to add only about 450 MW of hydel capacity per annum during 1990–7. Oil and gas supplies are limited. Thus we need to import fuel. This fuel could be coal, naphtha, or fuel oil. However, each has its own problems. Coal comes with a number of environmental problems. Despite the fact that both naphtha and LNG prices are linked to crude oil prices, the price of naphtha is more volatile. Naphtha price fluctuated between US$ 133 and US$ 210 between September 1997 and August 1998. Since naphtha is mostly used in the petrochemical industry, the demand of the petrochemical industry also influences naphtha price. Fuel oil is cheaper than naphtha but is not necessarily the most environmentally friendly of fuels. Thus LNG is desirable since it is all purpose, starting from domestic fuel to feedstock. In power generation, where the demand potential for LNG is maximum, it provides higher economic as well as environmental benefits as compared to all other fuels (Box 2).

LNG Projects in India

LNG projects involve substantial investment at both ends, upstream and downstream. A project involving of 5 mt of LNG per annum could cost US$ 3.4 billion. The typical cost build up for this is $ 2 billion for exploration, production and liquefication, $ 0.7 billion for regasification, terminals and ports, $ 0.5 billion for shipping, and $ 0.2–0.4 billion for pipelines.

In India, the projected LNG demand is 5-10 mt and 10–15 mt for the years 2005 and 2010 respectively. The government has opened the market to global players like Shell, Enron, and Total. These companies have shown an interest in investing in the required infrastructure which involves billions of dollars and will be critical for India. Petronet LNG has been established as a joint venture of domestic oil and gas companies like GAIL, BPCL, IOC, and ONGC.

In India, the CIF price of LNG prior to regasification is estimated at about US$ 11–90 per mkcal. The cost of regasification is in the range of US$ 1.98–2.38 per mkcal. Therefore, the cost of LNG could be US$ 13.89–14.28 per mkcal for plants near the ports, prior to fuel taxes and infrastructure charges. The similar cost for

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[3] For shipping transport, natural gas needs to be compressed to 1/600th volume at a temperature of –160°C and carried in this state to receiving terminals to be regasified before supplying to consumers in the importing country.

Box 2

Economic and Environmental Benefit of Using Natural Gas *vis-à-vis* Imported Coal for Power Generation

In India, a large demand potential for LNG exists for power generation. Compared to 4–5 years for an imported-coal-based power plant, a gas-based power plant can be put up within 18 months in the open cycle mode and 28 to 30 months in the combined cycle mode. Also, gas-based plants can be operated consistently at a plant load factor (PLF) of about 90–2 per cent, compared to a PLF of 75–85 per cent for coal-based plants, and can be turned on and off at very short notice (demand fluctuations). The investment costs are about US$ 0.7 million to US$ 0.9 million/MW, compared to US$ 1.1 million/MW for coal-based plants (at 1996 prices). The thermal efficiency of gas-based plants could be as high as 50–5 per cent, compared to 38–40 per cent for plants based on imported coal. Assuming a gas price of US$ 13.89 per *mkcal*, the cost of generation would be about 6–7 cents per kWh; for imported coal it may be higher.

Table 8.3 presents the environmental benefits from gas-based power plants *vis-à-vis* coal-based ones. So as concern about pollution grows, the use of gas is also likely to increase.

Table 8.3
Emissions from Coal (Imported)-based Plants *vis-à-vis* Gas-based Plants

	Unit	Coal—pulverized	Coal—PFBC	Coal—IGCC	Gas-CCGT
Efficiency	(%)	42	43	46	55
Carbon di-oxide	gm/kWh	830	810	760	380
Nitrogen oxides	mg/kWh	600	585	300	350
Sulphur di-oxide	mg/kWh	600	585	150	—
Cooling water heat losses	mg/kWh	4.3	3.6	3.2	2.6

Note: PFBC—Pressurized fluidized bed combustion, IGCC—integrated gasification combined cycle, CCGT—combined cycle gas turbine, mg—milligram.
Source: Powerline, May 1998.

imported coal is estimated at US$ 8.13 per mkcal. The landed cost of domestic coal at a thermal power plant in Maharashtra has been worked out to be US$ 10.87 per mkcal. LNG transactions are carried out through long-term contracts of 20–5 years. Among the important LNG projects are 5 mt owned by ENRON with regasification terminal at Dabhl and another 5 mt initiated by TIDCO with regasification terminal at Ennore. Reliance Industries is considering two projects with 5 mt capacity each with regasification terminals at Hazira and Jamnagar.

So far, the complete licensing requirements for setting up LNG-receiving terminals have not been clarified. The companies proposing to set up LNG import terminals have to get environmental clearances, clearances from the Reserve Bank of India and the Ministry of Legal Affairs, and land and right-of-way clearances from state governments. The government, however, is planning to set up a gas regulatory authority (GRA) which will cover both upstream and downstream issues and will come out with a regulatory framework for LNG imports. A bill to establish the GRA was supposed to be tabled in Parliament by the end of 1998. The existing policy allows LNG imports under open general licence. These imports command a basic duty of 10 per cent. Over this there is a special duty of 2 per cent. Since India does not possess any LNG vessels, foreign liners have to be used for the next couple of years. A draft on shipping policy allowing foreign liners to transport LNG to India is under preparation. The government has allowed the private sector to lay the gas pipeline distribution network.

Future Strategies

Some of the issues likely to arise in the near future that need to be urgently addressed are as follows:

- Import of LNG is an extremely expensive affair. Therefore, laying the pipeline from the LNG terminal, along with spur and distribution lines and above all the development of the consumer plants should be completed within the time set. The three activities of LNG import, transportation, and use should start at the same time and should be coordinated so that there is no any time lag between them. Otherwise contracts with the consumers, which permit 'take or pay' clauses would lead to heavy penalties in case of failure in minimum off-take of the contracted quantity.
- A huge amount of investment is required for laying a gas transportation network all over the country. It will be necessary to take policy initiatives and give fiscal incentives to encourage investment from private/public sector/joint venture companies.

- Issues regarding gas purchase contract, price, interstate gas transportation, safety, environment, etc. also need to be resolved.

Coal Bed Methane (CBM)

Coal Bed Methane (CBM) is a hydrocarbon gas, predominantly methane (CH_4) which is recovered from coal beds, inter-bedded with other sedimentary formations by drilling of wells like any other hydrocarbons. The United States produces nearly 55 mmscmd from more than 6000 wells. The potential of CBM resources in India is of the order of 800 bcm (R-Group, 1996). It can perhaps support a long-term gas production rate of 40–50 mmscmd. The technology of exploitation of CBM is broadly identical to the technology used for oil and gas production.

A thrust towards CBM exploration/exploitation is of importance in India. A committee set up by the MPNG compares landfall point price of gas from different sources and concludes that CBM is one of the cheapest sources with a price of US$ 7.14 per mkcal as against US$ 9.52 for piped gas from Oman or Iran and US$ 13.89 in case of LNG (*ET*,1997b). The GOI has formulated a policy on exploration and exploitation of CBM. The policy allows private sector participation in exploration. The award of CBM blocks for exploration will be based on open competitive bidding. However, this is only a first step that falls far short of a policy. The government's policy should also cover utilization/marketing/pricing/regulation, etc. to attract investment and promote the use of CBM.

CONCLUDING REMARKS

Given limited domestic energy resources in physical as well as financial terms and a large demand potential with a large number of consumers of different categories accustomed to consuming energy at subsidized prices, the challenge ahead for the country is to meet the energy needs at acceptable prices. At this juncture, reforms of the coal, oil, and gas sectors, in the form of introduction of competition at all levels, removing of government's control and protection, and gradual removal of subsidy are the right steps towards resource mobilization and enhancement of supply of assured quality. However, given the complex nature of the reforms process in technical, institutional and financial terms, and moreover in terms of political sensitiveness, the entire programme needs to be pursued with great efficiency, understanding, and sincere coordination between government, political parties, energy companies, and consumers.

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9

The Political Economy of the Revenue Deficit

Ashima Goyal

INTRODUCTION

India has been trying to reduce the fiscal deficit ever since reforms were initiated in 1991, but without much success. It has become necessary to ask why. Strong medicine can suppress a symptom, but a lasting cure is possible only if the root cause is treated. The political economy of India's revenue deficit lies at this root and must therefore be understood.

There has been a large amount of work on the political economy of reforms, but the dominant explanation for the decay in Indian government finances is still Bardhan's (1984) thesis of powerful vested interests, each getting concessions such as employment, subsidies, free loans, and cheap public goods. Farmers, traders, industrialists, bureaucrats, and unionized workers each benefited. If this were the whole story government consumption would be rising as a ratio of the GDP.

But examining disaggregated data on the government budget presents a few surprises. Government consumption expenditures as a ratio of the GDP were the same in the mid-1990s as they were in the mid-1980s. The component of current expenditure that has risen is interest payments.

This suggests an alternative view of the political forces that have impinged on budget making. The political necessity of lowering poverty[1] combined with cost shocks initiated the decay in government finances. It is well known that the Indian economy faced major supply shocks, such as a rise in oil prices and fall in agricultural output, in the 1970s. Political imperatives in a poor democracy made it difficult to raise user charges for public goods. The result was increasing cross-subsidization, where industry and the well off were to pay for provision of services to the poor. This is in itself a laudable social objective (apart from catering to dominant vote banks); but it had built-in incentives leading to a fall in quality and in investment as this chapter shows. Since capacity constraints soon appeared, poor quality, time delays, and controls, were used as rationing devices. It became increasingly optimal for the rich to opt out of the system. Private alternatives appeared to service them. The government lost revenue and the poor suffered non-monetary costs. A humane society requires cross-subsidization, but that is viable over the longer term only if the revenue budget is balanced and other economic criteria met. The cross-subsidization chosen was unsustainable as interest payments on borrowing made to meet shortfalls in revenue began adding on to deficits. My argument is different from the common one that public consumption must be cut when supply shocks occur. It is not consumption that creates problems as much as the perverse incentives that get entrenched when relative prices are not allowed to adjust after cost shocks. These harm the quality of provision of public services and the revenue raising capability of the government. The irony is that alternative policies were available to protect the poor. In the third section I explore the reason these were not used.

This analysis of political economy is more hopeful since if powerful vested interests exist, there is no reason why they should moderate their demands. But the user charges required to improve the revenue deficit will be

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[1] A very popular slogan of the Congress Party in the 1970s was '*garibi hatao*' (remove poverty). A number of policies were instituted to protect the poor, but unfortunately most of them were difficult to administer and created distortions in the economy.

more acceptable if the adverse role of pricing distortions in the face of cost shocks is recognized. Poor quality is as much a cost to the poor as high prices. There is evidence that people are willing to pay higher prices for better quality (see the fourth section). Politicians and bureaucrats are also victims of adverse circumstances and policy choices. They suffer from emptying coffers and poor reputations. Reorganization can quickly deliver better quality public service if the reasons for the decline in quality are recognized and steps taken to reverse them. The latter will bring the well off back into the revenue net and make feasible the public investment that can sustain a virtuous cycle of improvement. Because of the accumulated debt, a viable long-term lowering of revenue deficit will require complementary macroeconomic policies such as low interest rates and a managed exchange rate. In transition the fiscal deficit may have to rise to finance the required growth in investment. Some results can be achieved even without investment, as the latter requires finance and time. Just as cost shocks initiated the rot, improved technology available today can be harnessed to lower costs over a wide spectrum for the Indian economy. Falling international oil prices constitute a reverse oil shock, which will also help.

The chapter is organized as follows. The second section examines historical evidence. The third section then uses theories of incentives under imperfect information and the trade-off faced by policy to understand the motivations and actions of agents that lead to observed outcomes. The fourth section presents some of the specific outcomes of this interplay of motivations and then discusses policy that is politically feasible and can eventually reduce revenue deficit. The fifth section concludes.

IS THE GOVERNMENT PROFLIGATE OR IS IT CASH STARVED?

In this section budget data,[2] starting from the 1970s, are divided by GDP at market prices, in order to reveal trends. Figures 9.1 to 9.4 graph the ratios and depict trends from 1970–1. The diagnostic Figures 9.1 to 9.3 allow us to clearly identify the pathology. The diagnosis is confirmed using more detailed data and time series analysis from *NAS* and *EPW*.

Figure 9.1 shows that the savings of government administration turned negative in the early 1980s, while those of departmental enterprises and non-departmental enterprises increased marginally in the 1980s. The latter two could not compensate for the decline in the first component. Also capital formation in all three was falling by the late 1980s (Figure 9.2). Compensation of employees, as a percentage of GDP, increased steadily and in 1987–8 exceeded its 1970–1 level by about 2.5 per cent; but it began to fall after that (Figure 9.3). The ratio of net purchase of commodities and services in 1995–6 was the same as in 1970–1. Vested interest groups in government were not able to maintain their consumption and the government cut back on investment.

Finding 1: Thus it can be concluded that a steady worsening of government finances forced a fall in the share of capital formation and employee compensation in the public sector by the late 1980s. The ratio of purchase of commodities and services to GDP in 1995–6 was about the same as in 1970–1.

Government administration shows the major pathology; therefore this is now examined in greater detail. Although savings were negative, current expenditure in general administration rose in the 1980s (Figure 9.4); it was financed by borrowings. But both current and capital expenditure on health and education fell from the late 1980s (Figure 9.5). Capital expenditure on the latter two categories was only 0.14 per cent of GDP in 1994–5; it was always largest in general administration.

Finding 2: Borrowing was necessary to sustain a rise in the share of current expenditure in general administration in the mid-1980s. Spending on health and education suffered cutbacks in the 1990s. The ratio of capital expenditure was always low in these two categories and fell in general administration also by the mid-1980s.

Since current expenditure includes interest payments, we turn to the income and outlay account of administrative departments (Figure 9.6 and Table 9.1). This gives consumption and interest payments separately.

Figure 9.6 shows that even though current expenditure continued to rise from the mid-1980s, the ratio of consumption fell from 1988–9 and expenditure on subsidies from 1990–1 (Figure 9.6). These figures are for explicit subsidies; it is not known how hidden

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[2] The public sector comprises (i) government administrative departments, (ii) departmental enterprises like the railways, posts and telegraphs, other communication enterprises, and other departmentally run enterprises, and (iii) non-departmental enterprises (a) financial and (b) non-financial, which are wholly or mainly government-owned companies and public corporations. Administrative departments including defence services are said to constitute the general government comprising central and state governments, union territories, and all layers of local bodies and panchayati raj institutions. Administrative departments include those of central and state governments as well as local bodies. The data are the most updated available in the *NAS*, CSO.

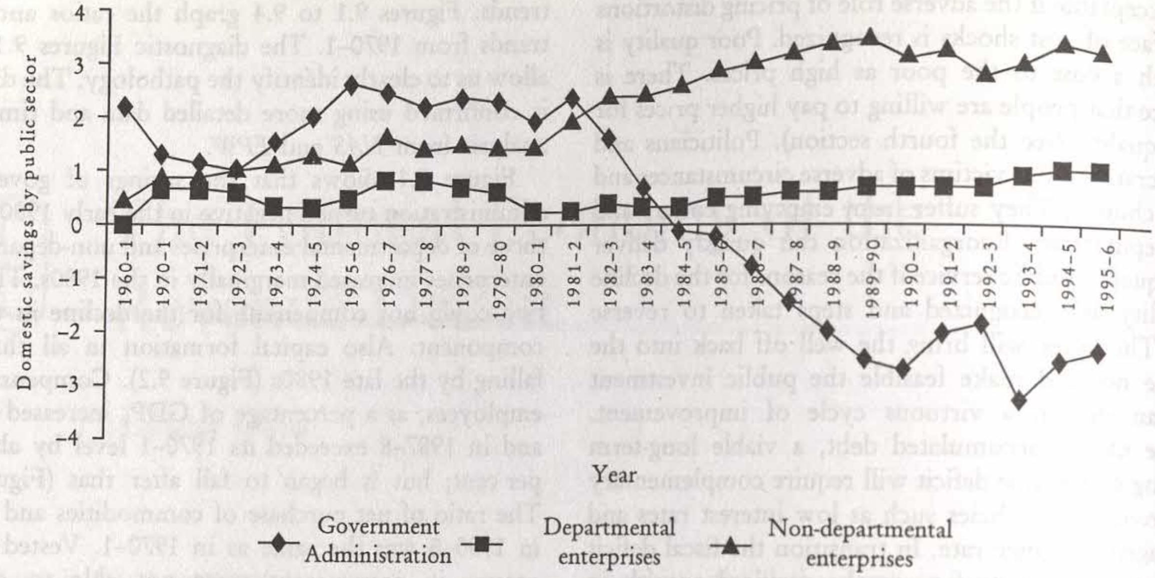

Figure 9.1 Public Sector Savings as a Percentage of GDP

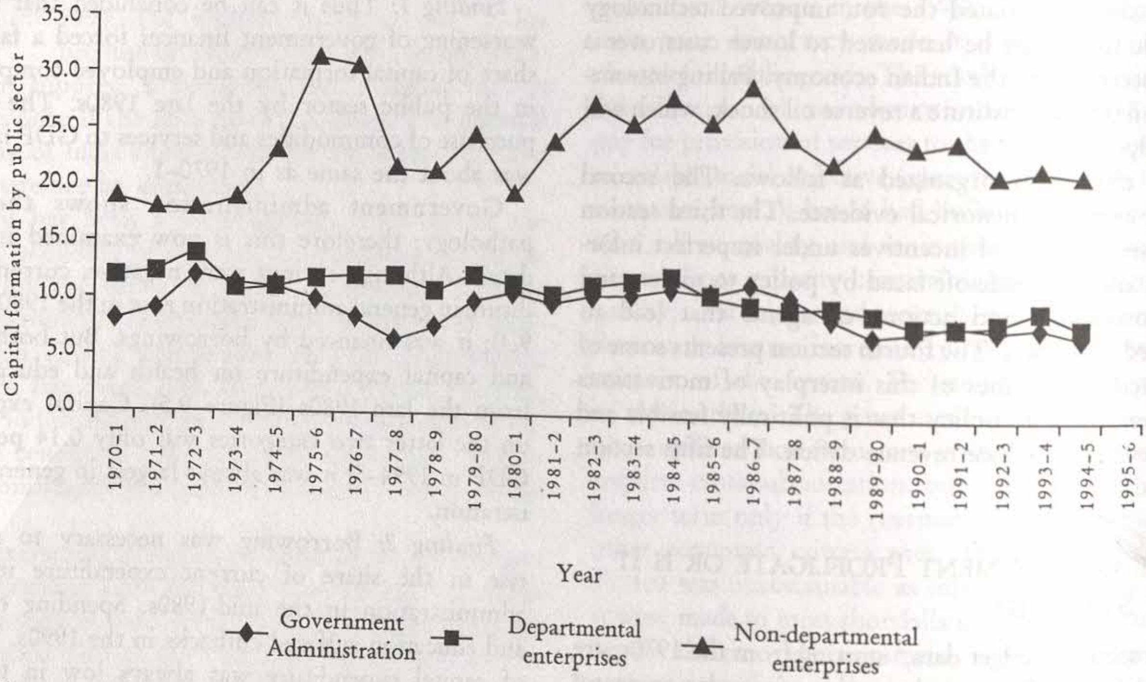

Figure 9.2 Public Sector Capital Formation as a Percentage of GDP

subsidies, comprising low user charges for a variety of public goods and services, behaved. A government white paper put these at 70 per cent of total central subsidy. Combined subsidies paid by central and state governments are said to be almost 15 per cent of GDP.[3] The direct tax ratio improved somewhat, but indirect taxes that comprise the bulk, fell from the late 1980s (Figure 9.7). The rise in current expenditure was due to interest payments on public debt. These have been rising from the mid-1970s, showing the cumulative effect of the cost shocks. The rise accelerated in the 1990s, following the freeing of interest rates (Figure 9.6). This, together with deterioration in the ability to tax, was the culprit that prevented improvement in government finances.

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[3] The figures are from Vinay Pandey (1998) who reports on recent research on subsidies.

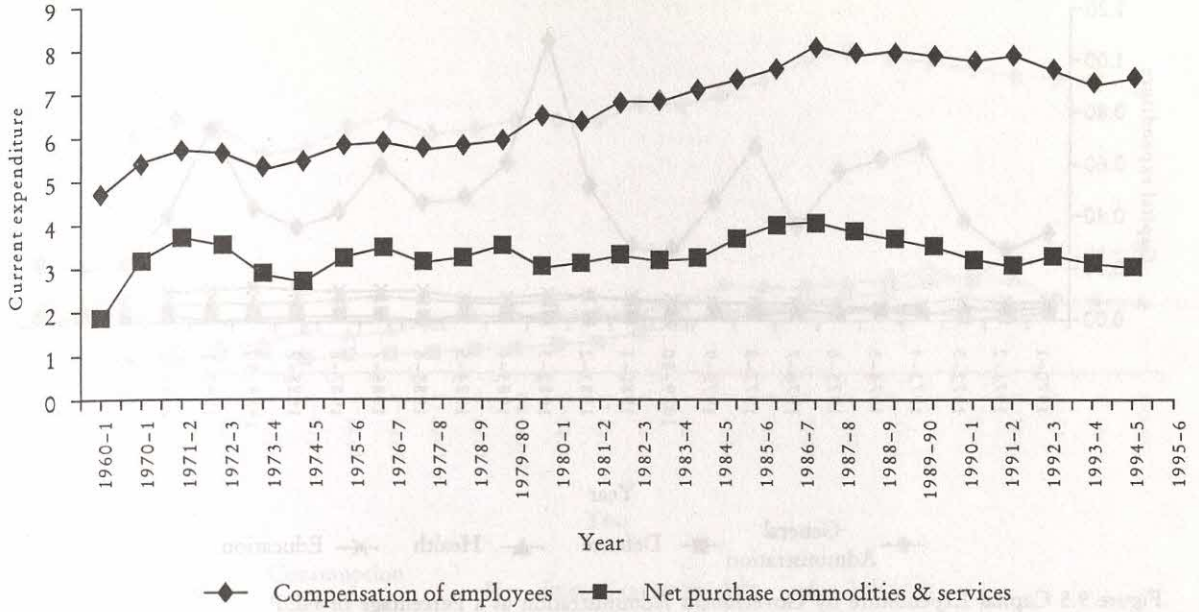

Figure 9.3 Public Sector Expenditure as a Percentage of GDP

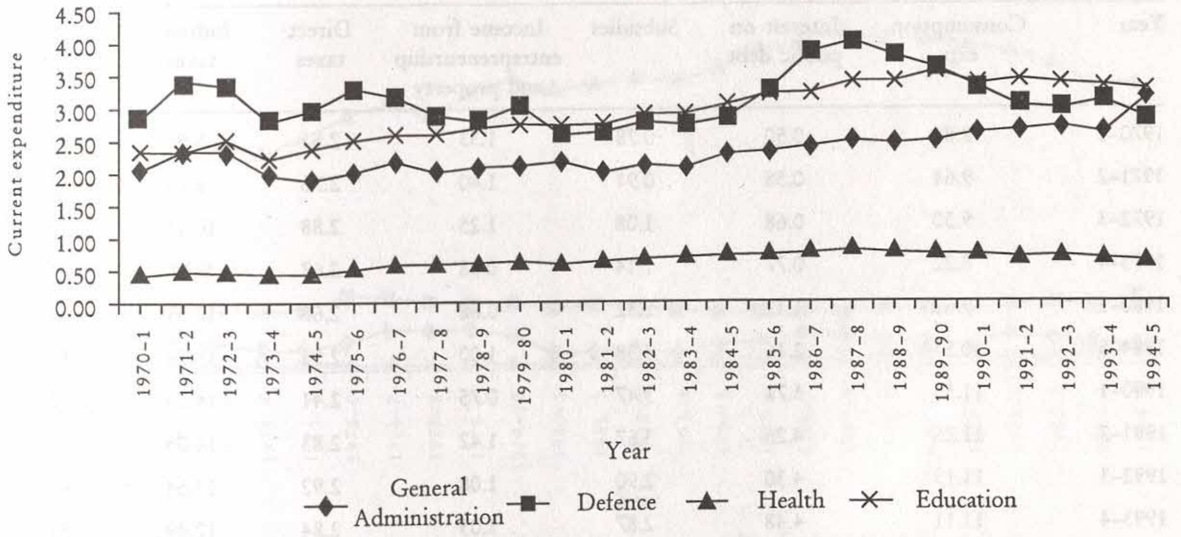

Figure 9.4 Current Expenditure by Government Administration as a Percentage of GDP

Finding 3: Since the 1980s the government has not been able to fund its current expenditures from current revenues. This led to a cumulative rise in public debt, interest payments, and revenue deficit. Although investment has been cut the most, government consumption has also suffered.

The huge employment in the public sector is often blamed for deteriorating government finances. Figure 9.8 offers some evidence that this is too harsh a judgement. Although the compensation of employees has risen, the rate of increase has been less than in the operating surplus. The ratio of compensation of employees to GDP has been falling in the 1990s. Non-departmental enterprises have been the most profitable among government organizations. And the government has been able to moderate wage demands sufficiently to improve profits. The rate of increase in operating surplus has normally exceeded that in wages. Public sector workers have not been powerful enough as an interest group to protect their share in the 1990s.

Finding 4: The ratio of compensation of employees to GDP has been falling in the 1990s, and has been

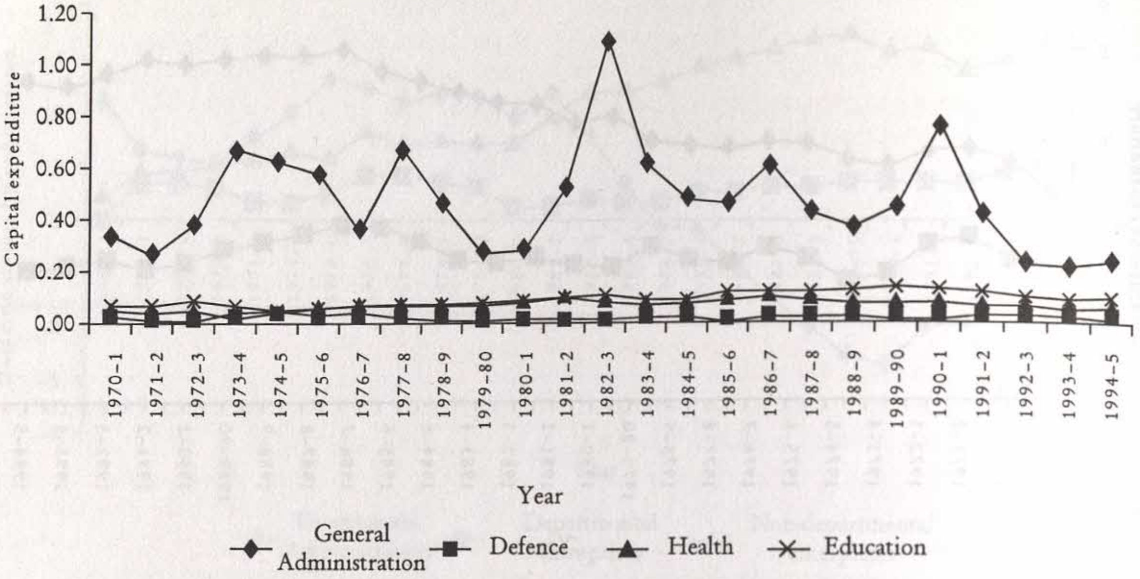

Figure 9.5 Capital Expenditure by Government Administration as a Percentage of GDP

TABLE 9.1

Income and Outlay Account of Administrative Departments

Year	Consumption exp.	Interest on public debt	Subsidies	Income from entrepreneurship and property	Direct taxes	Indirect taxes	Misc. receipts
1970–1	8.81	0.50	0.78	1.33	2.53	8.98	0.38
1971–2	9.64	0.58	0.91	1.40	2.76	9.76	0.59
1972–3	9.30	0.68	1.08	1.25	2.88	10.15	0.29
1973–4	8.22	0.77	1.14	0.88	2.67	9.48	0.24
1980–1	9.62	1.12	2.32	0.68	2.63	12.31	0.22
1984–5	10.53	2.16	3.38	1.00	2.51	13.24	0.39
1990–1	11.54	3.78	3.47	0.75	2.41	14.25	0.39
1991–2	11.26	4.26	3.67	1.42	2.83	14.05	0.35
1992–3	11.13	4.30	2.90	1.08	2.92	13.54	0.47
1993–4	11.11	4.48	2.87	1.03	2.84	12.49	0.53
1994–5	10.52	4.72	2.68	0.86	3.16	12.68	0.84

Source: Various issues, *National Accounts Statistics*, CSO (Statement 43 in 1996).

stagnating since the mid-1980s while the ratio of operating surplus to GDP in public sector enterprises has continued to rise.

Finding 5: Both current and consumption expenditure of government administration shows a peak in the early 1970s, and savings show a trough, coinciding with the severe cost shocks.

Most categories of government expenditure have fallen implying that vested interest groups are not powerful enough to be fully responsible for the deterioration in government finances. The rise in borrowing after the period of major cost shocks, together with the inability to raise tax ratios and the widespread fall in the quality of provision of public services, suggests

Hypothesis 1: The cost shocks of the 1970s triggered off a cumulative decline in government finances.

There is enough preliminary support for this hypothesis in the budget data to justify more comprehensive tests. The rise in interest payments from

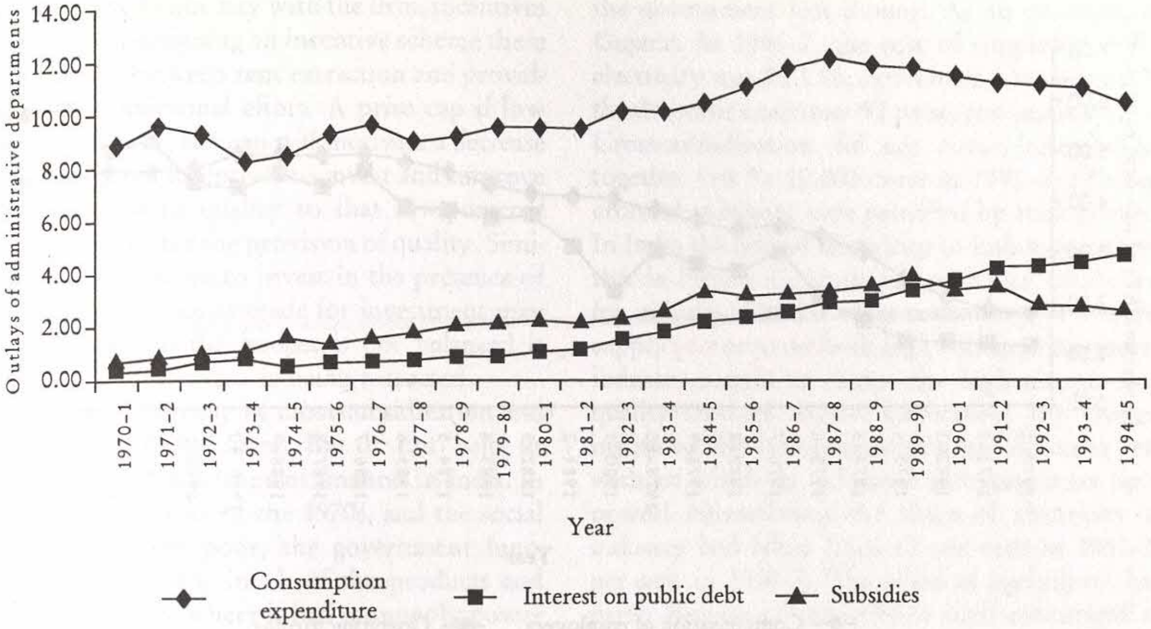

Figure 9.6 Expenditure of Administrative Departments as a Percentage of GDP

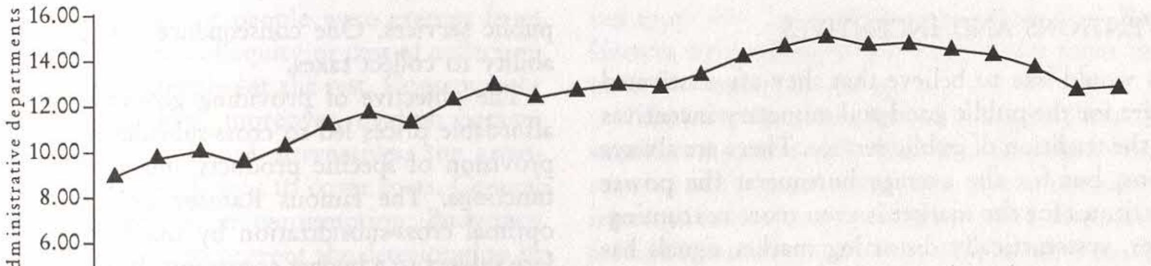

Figure 9.7 Income of Administrative Departments as a Percentage of GDP

the late 1970s is very clear. Two further types of tests are possible. First, using time series data on government budget, agricultural output, wholesale price indices, and broad money the direction of causality can be explored. Did revenue deficit raise money supply and cause inflation as is implied by the theory of interest groups? Or did cost shocks raise inflation and therefore revenue deficit and money supply? Initial tests done provide evidence of the impact of cost shocks and inflation on revenue deficit, in addition to the well-established channel from revenue deficit to money supply. Second, the effects of pricing policies following on the cost shocks can be examined for a number of disaggregated public sector bodies. This is a promising research project for the future.

But meanwhile theory can help us understand why these outcomes ocurred.

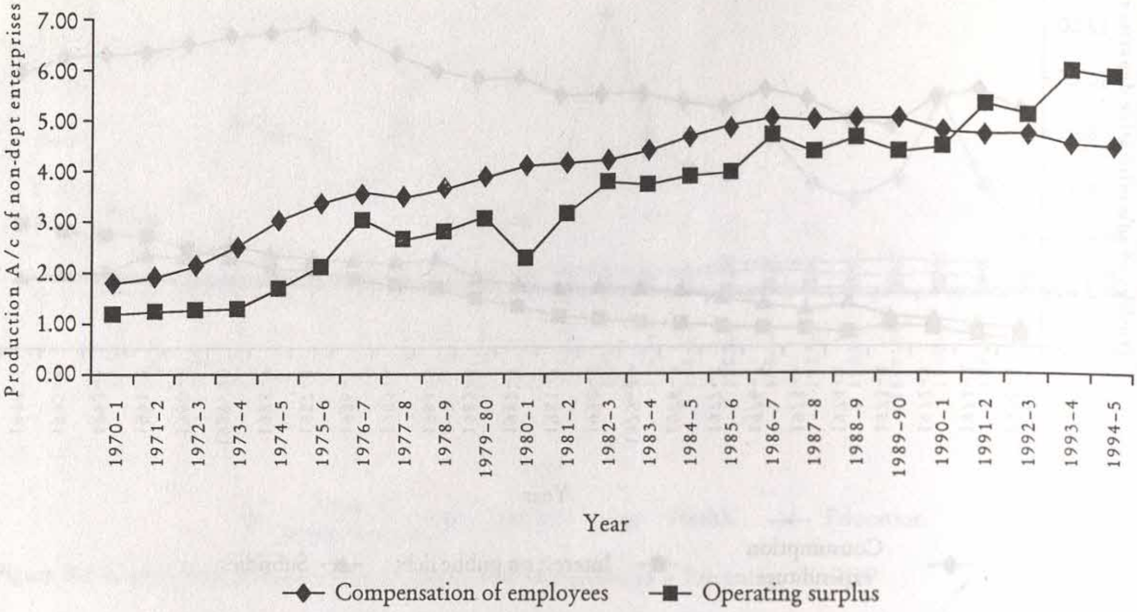

Figure 9.8 Compensation of Employees and Operating Surplus in Non-departmental Enterprises as a Percentage of GDP

INTERVENTIONS AND INCENTIVES

Officials would like to believe that they are motivated by a desire for the public good and monetary incentives demean the tradition of public service. There are always exceptions, but for the average bureaucrat the power that substitutes for the market is even more corrupting. Moreover, systematically distorting market signals has adverse consequences. After identifying the trends in the data, the theories[4] that illuminate these outcomes will now be examined.

The provision of government services is put under three heads: general administration, departmental, and non-departmental enterprises. The latter two charge for their products, while the costs of the first have largely to be covered by taxation. It is possible to regard the government as a large multi-product public service provider (PSP). The voting process determines the ownership of this PSP. Since the poor have the largest votes they have to be satisfied for the incumbent to remain in office. Therefore selling its products at an affordable price is a major objective of the government in a country with a large population of poor.

In itself this is a valid social objective. But in the face of the severe cost shocks of the 1970s, the way it was implemented led to a distortion of the incentives of the government to invest in improving the quality of public services. One consequence was a decline in its ability to collect taxes.

The objective of providing government services at affordable prices led to cross-subsidization both in the provision of specific products and across government functions. The famous Ramsey–Boiteux rule derives optimal cross-subsidization by maximizing social welfare subject to a budget constraint. It implies that prices should differ from marginal cost but the gap should be inversely proportional to elasticities of demand. For example, if the poor have lower elasticity of demand, the margin on products sold to them should be higher. The rule can take account of other objectives in social welfare such as redistribution and the provision of incentives, and has been generalized into the theory of optimal non-linear tariffs. But since the government budget deficit has been steadily deepening it implies that these theoretical principles have not been followed. The budget constraint has been violated; prices have not been derived from first principles. Moreover if, because of cross subsidization, the price in any sub-market exceeds cost, or if new technology lowers cost or breaks a natural monopoly, competitive entry occurs. Government revenues from these sub-sectors fall further.

There are two natural extremes in pricing rules that have opposite effects on the incentives of a firm to lower cost or improve quality. The first, a price cap, offers high powered incentives since the residual profit share lies with the firm. The second, rate of return regulation, provides the cost of the service so there is no motivation to decrease costs. Moreover as profits from improvements do not stay with the firm, incentives are low powered. In designing an incentive scheme there is always a trade-off between rent extraction and providing incentives for additional effort. A price cap if low enough extracts all rent, but can still motivate a decrease in costs. But it reduces incentives to invest and improve quality. Costs rise with quality so that low-powered incentives are required for the provision of quality. Similarly there is a disincentive to invest in the presence of price caps because sunk costs made for investment may be expropriated. When the budget is not balanced it implies that all the PSP's rent is being extracted.

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[4] Laffont and Tirole (1993) is a thorough treatment of incentives in regulation. Jha (1998) is a good up-to-date text that brings out the implications of new work on incentives for public economics.

This is the general theory of cross-subsidization and incentives for a regulated firm. But it can help us understand the state of government finances in India. In the face of the cost shocks of the 1970s, and the social objective to protect the poor, the government functioned with price caps for much of the products and services it provided. But where it had monopoly power and was servicing the rich, prices were raised much above costs of production. There was extensive cross-subsidization. The same principles were applied to tax collection. Large groups of people were exempt from income tax on arguments of equity or cost of collection and rates were raised steeply for the rest. Consequently the tax base is very low; moreover, evasion became pervasive. As the rich found alternatives, the cross-subsidization was not sufficient to cover costs. General revenues did not even cover consumption. Budgetary support was insufficient to prevent the deterioration in quality that came with price caps. Poor quality served as a cost that lowered consumption demand. In the fourth section specific examples that illustrate the working of these principles are examined.

The analysis in this section leads to

Hypothesis 2: Price controls in the presence of cost shocks lead to systematic incentives to lower quality and investment in the public sector. This reduces future capacity of the state to tax, invest, and provide services.

INTERVENTIONS AND OUTCOMES

Outcomes in different sectors, illustrate the working of these incentives in response to the mechanisms that were implemented.

Electricity: Charges to commercial users are much higher than to domestic consumers; in addition there is illicit tapping of electricity. Many states give free electricity to farmers. Frequent breakdowns and low voltage have forced the affluent to go in for captive power generation, and state electricity boards (SEBs) are in the red. The rich found ways to deal with the system and the government lost money. As an example, consider Gujarat. In 1996–7, the cost of supplying one unit of electricity was Rs 1.86; agriculture was charged 21 paise, the domestic consumer 91 paise, and industry 2.34 paise. Cross-subsidization did not cover losses.[5] The SEBs together lost Rs 10,000 crore in 1997–8, although 4000 crore of subsidies were provided by state governments. In India the cost of electricity to industry is three times that in France. In developed countries, tariffs are lower for industry than for other consumers, as it costs less to supply power to the bulk high voltage consumers. When industry sought to escape the high charges and poor quality through captive generation, the Gujarat SEB instituted the requirement of a no objection certificate without which an industrial unit cannot set up captive power! Nevertheless the share of electricity sold to industry had fallen from 62 per cent in 1950–1 to 35 per cent in 1996–7. The share of agriculture has risen partly because a fixed and low tariff encouraged overuse of agricultural pumpsets. Countrywide the latter consume 20 per cent of total power generated. Although farmers are favoured, unreliable supply makes them unhappy too. In experimental reforms in Rajasthan farmers were willing to pay four to five times the usual tariff for assured quality.

Telephones: International call charges are kept high, to subsidize domestic calls. The reasoning was to maximize revenue and to protect the poor, on the assumption that international calls are a luxury good. But companies formed in America made it possible to call from here and pay abroad. Again, the government loses revenue in spite of its domestic monopoly. New technology is hastening the process. In 1998 the cost of calling America using Internet telephony was Rs 4 per minute but the public sector monopoly charged Rs 75 per minute. The newly appointed regulatory authority, TRAI, is planning to change this: charges for international and inter-state calls are to be lowered, and those for local calls raised. It is also planned to raise fixed rental charges. The idea is that this recovers costs while utilization is stimulated by lower marginal charges. But in a poor country many potential consumers may not be able to afford high hook-up charges. A consumer organization called Grahak Hakka Parishad is protesting these changes on the grounds of the additional burden they impose on the less well off. A possible solution is to provide more public call booths for them. There are arguments that MTNL is a government monopoly that makes fat profits at the expense of the consumer. This process clearly demonstrates the political economy of price setting: a rise in price is resisted both to protect the poor and to prevent the government monopoly making excessive profits.

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[5] Information from a lecture given by G.B. Desai of Gujarat SEB, at a seminar at MS University Baroda, March 1998.

Railways: The railways have ostensibly followed average cost pricing (covering costs), but the annual contribution to the Depreciation Reserve Fund (DRF) has been used to present a falsely reassuring picture, since it was often less than it should have been. But "from the Fifth Plan the DRF was included in Plan resources, and the railways had to pay dividends on withdrawals. Their ability to use this internal resource for badly needed investment fell. At the same time budgetary support, as a share of total resources available to the railways, fell from 34 per cent in the First Plan to 15 per cent in 1993–4. Other economic criteria have been flouted. Freight rates have been raised to subsidize passenger travel. The railways have steadily been losing customers to diesel trucks. Since diesel is also subsidized this deals a double blow to government revenues, apart from raising pollution levels and freight costs. The average rate per passenger km was raised from 4 paise in 1980–1 to 15 paise in 1991–2, but the rise in the average rate per tonne km was more over the same period (from 10.5 to 35.1 paise), although the demand for the latter category is more elastic.[6] There is great scope for lowering costs and raising revenue by adjusting activities to different categories of demand. The 1998 rail budget made a start at lowering cross-subsidization by concentrating fare increases on passenger traffic.

Education: The low fees and salaries in higher education, and pressures due to insufficient expansion in facilities have led to great deterioration in standards. Teaching in Junior colleges in Mumbai, for example, is almost entirely usurped by coaching classes that have better teachers and equipment. They charge huge fees that are willingly paid, while the colleges wither away. This is also responsible for the brain drain as more students go abroad for studies and then settle there; moreover students pay enormous sums to foreign universities for a decent education. For example, in Delhi University annual college tuition fees have remained at Rs 180 for the past five decades; a student pays less than 5 per cent of the total cost of his/her education. But an attempt to raise tuition fees by 200–300 per cent, in response to a 20 per cent cut in UGC grants, provoked widespread student agitation and had to be withdrawn. Other institutions have succeeded with a more gradual rise in fees; acceptability demands that such moves are linked to a perceptible improvement in quality and an equitable sharing of burdens. But reasonable need-based subsidies in education have a role in the future. Cheap technical education has played a great role in developing the labour skills, such as in computer software, that India is becoming famous for.

Irrigation: The subsidy for canal irrigation rates is almost 100 per cent. At the same time the cost of providing water through public canals has risen steeply[7] and quality of supply has fallen. Farmers are willing to pay higher rates for irrigation that is more flexibly adapted to their needs; they have shown this by switching to tube-well irrigation even though they have to pay for the latter. The proliferation of private tube-wells (run on subsidized electricity) has adverse externalities, such as lowering of the water table. Total consumption of groundwater resources has risen from 4 million hectare-metres (MHM) in 1970 to 54 MHM in 1998. It is expected to exceed the recharge level of 67 MHM by 2005. In nineteenth-century Gujrat wells were designed to catch rain and flood water, so that water remained a renewable resource. Community, rather than individual, management prevented overexploitation. Such practices need to be renewed. Today subsidies tend to be captured by the rich. In West Bengal erstwhile landlords have become water entrepreneurs. They pay a fixed electricity charge of Rs 1500, and no sales tax, and then sell water in the surrounding area. It is true that the water rates are sometimes regulated by panchayats, and the improvement in availability of electricity from the mid-1980s has coincided with a large rise in agricultural production. Both electricity and water are essential infrastructure but the only way to ensure their long-term supply is by pricing them to cover costs and discourage overuse, in addition to restructuring and decentralizing delivery mechanisms.

Roads and State Transport Units (STUs): Roads constitute a major component of the transport sector and are expected to carry 80 per cent of passenger traffic and 50 per cent of goods traffic. Out of a total share of transport in the Eighth Plan outlays of 13 per cent, the share of roads was 23.6. The road network has been expanding steadily but remains inadequate both in terms of quality and requirements. The chronically ill STUs offer a copybook illustration of the predictions of theory. Financial losses of STUs in 1996–7 were 1414 crore, but fare hikes were withheld for political reasons and concessions given to different categories amounted to Rs 486.12 crore. Although personnel costs increased by 10.95 per cent and material costs by 11.2 per cent, only 17 of 70 STUs revised fares. Personnel costs account for 46 per cent of revenues and material costs 36 per cent. Retrenchment is ruled out. There are other inefficiencies responsible for high cost and poor quality. Although overall fleet utilization was 88 per cent it was as low as 14.7 per cent in Bihar. But privatization is not the answer. The share of STU buses in total buses has fallen from a peak of 48.2 per cent in 1980 to 26.3 per cent in 1995; but the private transport that has replaced it is ill-regulated, hazardous, and ignores non-profit making sectors. There are externalities in the provision of cheap and efficient bus services, since they reduce dualism and draw remote areas and the poor into the modern economy. Revitalized STUs have to play a major part in this.[8]

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[6] See Sriraman (1997) for more data on these issues.

[7] Dhawan (1997) calculates that the cost per hectare of canal irrigation at constant prices increased from Rs 488 to Rs 608 over 1980–1 to 1992–3. The data on Bengal come from the field trips made by Vikas Rawal in the course of his Ph.D. on irrigation in West Bengal.

Taxes: The belief that large classes of Indian people were too poor or too deserving to pay taxes has led to such a narrow tax base that the Indian tax–GDP ratio (about 17 per cent) is one of the smallest in the world. The average ratio is about 31 for industrial economies and 18 for developing countries. Because a large part of the economy is in the unorganized sector where returns are not routinely filed, it is believed that Indian GDP is 60 to a 100 per cent underestimated. In that case the tax–GDP ratio will be even smaller! Low tax collection, low user prices for public goods, and low returns on public investment severely limit the services the government is able to offer.

These examples repeatedly demonstrate the picture of prices held constant in the face of cost shocks; coercive but ultimately unsuccessful attempts at cross-subsidization; budgetary losses combined with falling investment and quality. If the consequences of holding prices constant in the face of adverse cost shocks are understood, clear implications follow for policy. Moreover, the acceptability of these changes rises, especially if alternatives are adopted to protect the poor.

Policy: In public goods, where there is a tight link between payment and use, a gradual rise in user charges will be accepted, if quality is raised simultaneously. Only sustainable cross-subsidization should be undertaken; attention must be paid to relative demand elasticities as well as redistribution objectives. Institutional reorganization will allow services to be varied to offer consumers a menu of price–quality options.

Joskow (1998, 54) suggests that for developing country infrastructure 'a fixed price/price cap mechanism with quality of service and performance norms and specific provisions for evaluation and adjustment over time is likely to provide the most effective... approach in many cases.' The fixed prices we have followed in India need to be adjusted to ensure quality and investment, but maintain pressures to decrease costs. The latter is very important because the coercive ways used to maintain cross-subsidization have bred suspicion of the government as an extortionary and inefficient organization. It does exploit monopoly power in certain areas, but in the aggregate, has not been able to recover costs. If the argument here regarding incentives is correct, in the restructured framework enhanced revenues will be used productively, and will not merely raise government consumption. Apart from price caps, one way to lower costs is to invite competition from private parties. But the latter also need to be regulated to ensure that they maintain safety standards and service · some uneconomic sectors as well.

Non-discretionary and non-distorting methods of protecting the poor should be adopted. Among these are increasing the productivity of agriculture and maintaining the price of basic foods in line with average purchasing power. Food prices serve as a standard for all other prices in a poor country. Historically, poverty has risen in the short run and inflation in the medium run with food prices. Countries that have avoided rising inequality in their developmental periods (for example the USA) have been those with a plentiful and cheap supply of food. Cheap food is especially important for a country with high population density. Managing the nominal exchange rate together with gradual agricultural liberalization can achieve the twin objectives of giving incentives to farmers and maintaining basic food prices in line with average purchasing power (Goyal 1998). Since food price enters all prices, this is one nominal price that needs to be managed. In an inflationary context, the distinction between relative and nominal prices needs to be carefully understood. This policy set offers a substitute that can avoid the huge transaction costs and poor targeting that have been documented with the working of the public distribution system (PDS) (Dev, 1998). It has worked more as a price support for farmers than as an income support for the poor. Employment guarantee and other self-targeting schemes, and community homes for destitute groups are also substitutes for the PDS. General subsidies for food or public goods such as education should be given through a coupon system of entitlement.

Gradually, filing tax returns should be made compulsory for the entire working population, although all will not be taxed. Linking rights and entitlements to filing tax returns and keeping tax rates low will encourage this. The electronic media can be used to instruct, enable, and facilitate filing in spite of illiteracy. Computerization will make it possible to build up a database on tax assesses. Eventually it may even be possible to have a coupon-based negative income tax,[9] one of the cleanest ways of alleviating severe poverty.

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[8] Vaidya (1998) reports on research done at CIRT, Pune.

After twenty-nine years America has a balanced budget. The chief feature of fiscal reform has been the systematic removal of incentives for wastage. For example, there was a shift from matching to block Federal grants for state welfare payments; the former motivated the states to overspend. In India awards to states based on filling trend non-plan revenue gaps, have rewarded fiscally profligate states. Transfers from the rich to the poor states can continue by having higher block grants for the latter; but an incentive component can be added linked to fiscal prudence and efficiency. A percentage of the transfer should depend on state GDP per capita growth in the last year. This will enhance healthy competition among states. At the same time global norms should be evolved to prevent unhealthy competitive lowering of tax rates on mobile factors such as capital and make harmonization of tax and user charges possible. Allowing states to tax services will improve their revenue raising capabilities.

Both governments and markets are needed. Either one has serious lacunae without the other. The systematic removal of discretionary controls will remove some of the disincentives that have corroded and corrupted government. The rationing required if prices are kept low invites corruption. But, as has here been argued, some positive incentives are also required to improve quality of public goods. There is ongoing debate on structures that lead to good governance. Bureaucracies have multiple agents and principals, often pulling in opposite directions. Dixit (1996) has suggested that a structure in which each principal offers a positive incentive, without simultaneously offering disincentives for other tasks the agent has to carry out, gives good results. Discretionary checks politicians impose act as disincentives on the bureaucracy's willingness to meet the demands of the public.

But past choices have left us with a high revenue deficit and public debt that has to be lowered, without harming growth. There are ways to do this. First, reorganize to improve quality along with a rationalization of user charges. Second, raise public investment in infrastructure and in human beings; borrowing if necessary in transition, using innovative financial instruments. This is viable because it will raise tax prospects in the future. Credit-rating agencies will forgive a rise in fiscal deficit if the revenue deficit falls and growth is high. Third, keep interest rates at foreign levels. This will lower Indian interest rates, prevent exchange rate volatility, and help the government borrowing programme. Fourth, use supply side policies to keep inflation low. Low interest and high growth rates are the fastest way to reduce the debt–GDP ratio.

CONCLUDING REMARKS

In Greek plays tragedy was never purely the outcome of fate; human motivations entered richly and often fatally. There was no villainy, however, only frailty. In an analogous way, the means used to achieve valid objectives amplify the exogenous shocks of the 1970s. It was doubly unfortunate because there were no villains; players often had the best of intentions. The controls and corruption that resulted were not inevitable or intrinsic. Markets are required not to free greed but to free the individual, and if freedom is used to develop character rather than self-indulgence, greater market incentives will not give a further boost to corruption.

Better alternatives are available to achieve a just society. Understanding the cause for the pervasive decline in quality will make a reversal easier. A pricing policy of public goods that provides incentives to increase quality and investment while lowering costs will be more easily accepted. It will then be possible for political parties and state governments to come together and act on this platform. The process would be helped by macroeconomic policies that keep interest rates low and prevent exchange rate volatility, while supply side policies keep inflation low. A correction of the perverse incentives that have corroded the system is a dramatic reversal that can turn tragedy into prosperity.

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[9] Wagle (1998) estimates the cost of giving supplemental income to raise the poor above the poverty line to be Rs 45,700 crore a year; this is about 50 per cent of the centre's tax revenue. It can only be implemented in phases, and would have to be tied to computerization that makes available indirect sources of information on income, such as inputs and consumption, and allows an expansion of the tax base. This would minimize conflict over tax assessments. It should be in the form of entitlements to health care, education, and food to improve earning power. If it is less than EGS (Employment Gaurantee Scheme) wages it would preserve incentives to work and discourage long-term dependence. At last the state would be able to redeem promises made in articles 39 and 41 of the Constitution, that guarantee the right to work, to education, and to assistance in case of disability. These were included in the Directive Principles of State Policy, but were not made judicially enforceable since at that time they were deemed economically infeasible.

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10

India's Public Finances
Select Issues and Suggested Reforms

Raghbendra Jha

INTRODUCTION: CHARACTERISTICS OF TAX REFORM

This chapter provides a selective overview of tax reform in the Indian context. A complete analysis of tax reforms is a complex issue and is strictly outside the scope of this chapter. I am interested in addressing two specific issues here: (i) are the broad trends in tax changes in India consistent with the principles of tax reform? and (ii) is the Government of India facing a fiscal crisis? Within the realm of these two issues some suggestions for policy reform will be advanced.

As an economy develops, reliance on indirect taxes such as excise, as a source of revenue, should fall and that on direct taxes increase. This is because indirect taxes have a number of drawbacks associated with them. A tax on a commodity raises its price. This will lower the demand for it and consumers will lose some consumer surplus. The tax collected by the government is less than the loss in consumer surplus. The difference is called deadweight loss. Indirect taxes are considered efficient where for a given amount of tax collection, the deadweight loss is minimized. If the tax rates are different for different commodities, they are called distortionary as they distort relative prices. Efficient indirect taxation, if it is distortionary, would call for commodity tax rates to vary inversely with the compensated price elasticity of demand (Jha, 1998a ch. 13). This is because the lower the compensated elasticity of demand the smaller is the deadweight loss of taxation (Figure 10.1). This would imply that necessities should get taxed at higher rates than luxuries. Thus efficient commodity taxation can be regressive because the poor would be taxed proportionately more. If, however, we opt for redistributive commodity taxation the regressive nature of commodity taxation gets reduced somewhat but the extent of redistribution[1] that is possible is quite small and efficiency is reduced (Jha, 1998a, ch. 13).

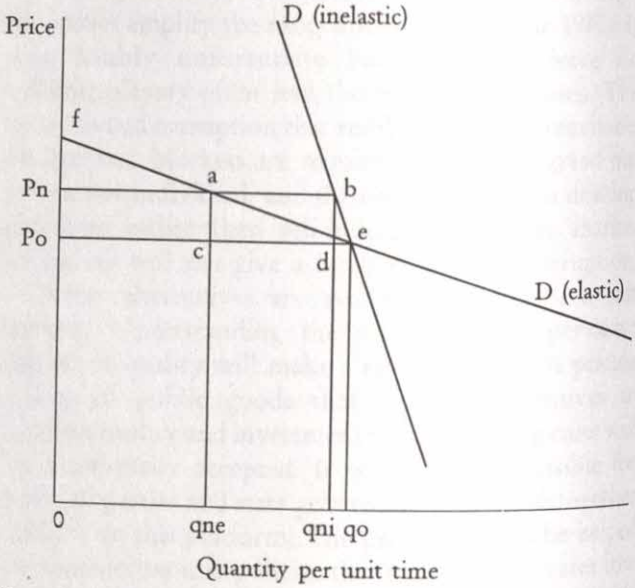

Figure 10.1 The Notion of Excess Burden of Taxation

If primarily direct taxes and non-distortionary commodity taxes are relied upon for tax revenue, the economy would grow faster, *ceteris paribus*, as compared to a situation in which there are too many distortionary taxes. With higher economic growth would come higher

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[1] As a matter of fact if there is no uncertainty and the household utility function is weakly separable between leisure and other goods, the optimal (in the sense of minimizing excess burden) commodity tax (redistributive or not) is zero. See Atkinson and Stiglitz (1980).

Box 1

The Notion of Excess Burden of Taxation

Figure 10.1 illustrates the notion of excess burden of taxation or deadweight loss in taxation. Two possible compensated demand curves are plotted: D(elastic) is more price elastic than D(inelastic). We need compensated rather than uncompensated demand curves (a compensated demand curve is one which shows the relation between quantity demanded and price of a commodity when the consumer is compensated by additional income transfer so that his/her utility is constrained to remain constant) since analysis with the latter is not path independent (Jha, 1998a, Ch. 2). Price before the tax is Po and the quantity bought is qo. For the sake of simplicity and without any loss of generality let us consider horizontal supply curves. With the imposition of a tax, price goes up to Pn. Quantity demanded falls to qni along D(inelastic) and to qne along D(elastic). Deadweight loss due to the tax is the loss of consumer surplus over and above what the government collects as tax revenue. Consumer surplus is defined as the area under the demand curve up to the quantity purchased less the amount paid. For elastic demand, before the tax is imposed, this is area ofeqo less area $OPoeq_o$, i.e. area P_ofe. After the tax, with elastic demand the deadweight loss would have been the area of the triangle *ace*. However, if demand was inelastic, the excess burden would have been only the area of the triangle *bde*. Hence the excess burden is much lower with inelastic demand and goods with elastic demand should be taxed less than goods with inelastic demand to minimize the deadweight loss of taxation. Furthermore, with the same price rise the tax revenue collected would have been higher had the demand been inelastic (area of rectangle PnbdPo) compared to a situation with elastic demand (area of rectangle PnacPo).

tax revenues and an easing of budgetary pressures. Hence, in the design of good direct and indirect tax structures, the implications of such structures for economic growth should be kept in mind.

Within the broad categories of both direct and indirect taxation, much streamlining has to be effected. First, within direct taxes reliance has to be shifted from corporate to income taxes. The rationale for corporate taxation is quite weak since corporate profits paid out are taxed as individual incomes anyway. The only real rationale for corporate taxes is that some non-competitive profits, which may otherwise be missed, may be caught this way. Within the category of income taxation, the rate and exemption structures have to be rationalized. The 'new' public economics in the tradition of the Nobel laureates William Vickrey and James Mirrlees recognizes the difficulties of taxation under conditions in which individual work efforts and abilities are unobservable. Under such conditions, it is always advisable to ensure that very high ability workers are induced to work as hard as possible since their effort adds a considerable amount to the size of the national pie. This would be possible only when these workers face low marginal tax rates. Hence the optimal tax structure (one that maximizes a social welfare function with the size of the pie as well as its distribution as possible arguments) should allow for low marginal tax rates at high income levels.[2] Further, the Vickrey–Mirrlees result holds when *all* incomes are taxed. In other words, there is no room for excluding large sources of income (such as agricultural income in the case of India[3]) from the tax net. If one taxes 'full' income, the number of tax slabs need not be too large and mild progression can be built into the tax structure.[4]

As far as commodity taxes are concerned, tax reform theory would call for reduced reliance on commodity taxes. Further, these should be so designed as to leave as many relative prices untouched as possible.[5]With this the distortionary impact of commodity taxes would be minimized and the purpose of attaining higher rates of economic growth would be facilitated. One way of approaching this problem is to institute a value added tax (VAT). This has the advantage that prices of intermediate goods do not change with the imposition of the VAT. If the supposition is that the price structure as established by the market is 'correct', then an additional requirement would be that relative prices of final goods do not change either. This would be possible if a single rate VAT which taxes all final goods at the same rate and, thereby, leaves their relative prices unchanged, could be imposed. In a federal system like ours, this would require that central and state-level VAT rates should be appropriately harmonized. A VAT has the additional advantage that the cascading effect (a tax on a tax, for example) that is inevitable with a general sales tax would be avoided, since a VAT would give credits for taxes paid at upstream stages of production.

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[2] Strictly speaking, the marginal tax rate at the top end of the ability distribution should be zero. See Jha (1998a), Ch. 14.

[3] Some people have argued that agricultural income need not be taxed since all these years we have discriminated against agriculture by having an overvalued exchange rate. This is a fallacious argument. If the exchange rate was overvalued and agricultural exports were discouraged as a result, this should not be compounded by not taxing agriculture. The remedy is to stop overvaluing the rupee. In economics as in life, two wrongs do not make one right.

[4] It ought to be remembered that a tax can be progressive even when the marginal tax rate on the highest income is zero. For example, a candidate linear tax structure where tax liability (T) is given by $T = -G + tY$, $T \geq 0$, where G is an exemption limit, Y is income, and t is the fixed rate of tax, is progressive because the average rate of tax rises with income but marginal tax rate is constant.

[5] This would be particularly relevant for intermediate goods with taxes on final goods varying inversely with compensated elasticities of demand.

Against this background it is pertinent to examine how the Indian tax structure has performed. First, so far as tax mix is concerned, the picture is certainly disconcerting. Table 10.1 shows the evolution of tax shares in the Indian economy during the period 1950–1 to 1995–6. The share of direct taxes fell sharply and reached a nadir in 1991–2. It has picked up a bit since but in 1995–6 was only about half its level in 1950–1. Within direct taxes, the share of income taxes has fallen and is low, and the share of corporate taxes has risen by about 50 per cent from its 1950–1 level.

TABLE 10.1

Share of Direct and Indirect Taxes in Total Tax Revenues of Centre, States, and Union Territories

(percentages)

Taxes/Years	1950–1	1965–70	1975–80	1985–90	1990–1	1991–2	1992–3	1993–4	1995–6
1. Direct taxes of which	36.79	23.3	19.87	14.09	13.9	16.1	16.9	17.8	19.4
1.1 Corporation tax	6.28	9.18	8.17	6.34	6.08	7.6	7.79	8.2	9.3
1.2 Income tax	21.37	9.79	8.66	6.03	6.1	6.5	6.9	7.4	8.1
1.3 Wealth tax	0	0.34	0.41	0.26	0.26	0.29	0.4	0.12	0.05
2. Indirect taxes of which	63.21	76.70	80.13	85.91	86.02	83.8	83.01	82.1	80.5
2.1 Customs	25.08	14.64	14.24	23.21	23.5	21.5	20.8	18.1	17.8
2.2 Union excise duties	10.78	33.42	34.15	29.0	27.9	27.24	27.0	26.0	25.9
2.3 State sales taxes	9.63	15.26	18.79	20.38	20.7	20.88	21.0	23.07	20.9

Source: India: Public Finance Statistics, various issues.

As far as commodity taxes are concerned, their share went up form 63.21 per cent in 1950–1 to 85.91 per cent in 1985–90. This fell slightly to 80.5 per cent in 1995–6. Within commodity taxes the share of union excise duties rose sharply from 10.78 per cent in 1950–1 to 34.15 per cent in 1975–80 and was slightly lower at 25.9 per cent in 1995–6. As if to partly compensate for this, the share of state sales taxes has been rising almost continuously from 9.63 per cent in 1950–1 to 20.9 per cent in 1995–6. The share of customs duties fell from 25.08 per cent in 1950–1 to 14.24 per cent in 1975–80 during the heydays of 'self-sufficiency'. It has increased in the 1980s and 1990s.[6]

This account does not present a flattering picture of Indian tax policy.[7] The drop in the share of direct taxes and the high share of commodity taxes indicate an inappropriate tax mix. Within direct taxation the shift to corporate taxes is unwelcome and indicative of the difficulties the authorities are facing in collecting income taxes. It is much harder to evade corporate than income taxes.[8] The small drop in union excise duty shares and the concomitant large rise in state sales tax shares imply that the states are responding to budgetary problems, at least partly, by increasing sales taxation—thus adding to the distortionary burden of overall commodity taxation. It seems a harsh thing to say, but India probably had a better tax mix at the dawn of Independence than it now does. The tax structure in India is not in conformity with some basic tenets of tax reform theory.

To be sure, there have been some changes since the tax reforms began in 1991. These would include the following. Marginal income tax rates at the top have been cut and the number of slabs has come down. The mean and variances of import duties have been decreased. Quotas have been replaced by tariffs. Some rationalization of the commodity tax structure has taken place and a central MODVAT has been introduced. These steps are welcome, but in no way complete. Rationalizing a rate structure for an income tax that is not applicable on all incomes and has a number of indefensible exemptions, is not enough. For fear of losing tax revenues, corporate tax rate has not been cut. In most countries where a VAT has been introduced the process has been characterized by three factors. First, almost the entire domestic commodity tax structure has been replaced by the VAT (with appropriate harmonization between central and state governments in the case of federal countries). Second, a concerted programme of taxpayer education has preceded the introduction of the VAT. Third, one rate of VAT is chosen with only very rare exceptions. Contrast this with the Indian case. In India, MODVAT was introduced (at central level only) for some commodities and then extended (again at central level for some commodities). The union excise duties and state sales taxes remain intact. MODVAT was introduced as a *fait accompli* with no taxpayer education worth speaking of. Third, even the Tax Reform Committee suggested as many as three rates of VAT to replace union excise duties.[9] Hence tax policy in India presents a somewhat dismal picture. It would probably not be too much of an exaggeration to say that tax policy has been the most neglected area of policy reform in India.

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[6] Although tariff duties and implicit tariffs through quotas were higher during the days when self-sufficiency was pursued as an end in itself, the share of customs duty was lower because of sluggish economic growth. Consumer goods were more or less forbidden from being imported and industrial demand for imports was low because of sluggish industrial growth.

[7] The appendix to this chapter carries six tables which compare India's performance with groups of countries and support this view. Table A10.1 shows that tax revenues as a percentage of GDP are low in India. Table A10.2 shows that India's indirect tax performance is wanting and Table A10.3 shows the same for direct taxes. Tables A10.4, A10.5, and A10.6 show that India's internal debt and deficit are high by international standards.

[8] To be sure if one exempted dividend income from income taxation then with a corporate tax alone one would not be taxing dividend twice. But tampering with the definition of income in this manner would not be advisable. It is better to include dividend

PUBLIC EXPENDITURE

In India there have been four distinct phases in real public expenditure since the 1970s. These are as follows:

(i) Phase I (mid-1970s to 1981). During this phase real public expenditure was growing at about 7 per cent per annum. Both revenue and capital expenditures were growing at about the same rate. This growth was higher than the rate of growth of governmental revenues. However, recourse to external and internal borrowing was still quite modest and monetization of the deficit was occurring quite steadily. The size of fiscal deficit was about 5 per cent of GDP. (Fiscal deficit here and in the rest of the chapter refers to the combined deficits of central and state governments).

(ii) Phase II (1981–6). During this phase the rate of growth of government expenditure went up to about 10 per cent. A further characteristic of this phase was that the share of revenue expenditure went up considerably: revenue expenditure grew at about 11 per cent per annum whereas capital expenditures went up at the old rate of about 7 per cent. Revenue expenditures outstripped revenue growth so that the government was borrowing to finance revenue expenditures rather than capital expenditures. As a consequence fiscal deficit went up (to about 9 per cent of GDP).

(iii) Phase III (1987–90) involved some attempt to rein in the growth of public expenditure. The impact of this was felt exclusively on capital expenditure as revenue expenditure kept growing at very high rates (10 per cent per annum). Overall growth of public expenditure was 8 per cent. A new aspect of the increase in revenue expenditure was the burden of accumulated public debt. The transgressions in terms of high revenue expenditure growth in the second phase had now impacted severely on the budgetary process. The growth of capital expenditure was cut back to less than 1 per cent in real terms. This had the implication that public investment relating to social infrastructure started to stagnate. Almost half of fresh borrowing was being used to finance current expenditure.

(iv) Phase IV (1991) began with the structural adjustment programme initiated in 1991. At the behest of the IMF there was a serious attempt to rein in fiscal deficit. Two measures were taken to do this. First, there was a further serious cut in capital expenditures. In fact, for a substantial part of this period capital expenditures actually registered a negative rate of growth. The growth of revenue expenditures continued almost unabated. Second, there was a sharp drop in the amount of central transfers to state governments, particularly on the capital side of the budget. Fiscal deficit was cut to about 7 per cent of GDP but was back to 9 per cent by 1993–4. The burden of debt has grown enormously. Interest payments on the public debt increased from 4.31 per cent of GDP in 1991–2 to 4.68 per cent in 1997–8. The size of the interest payment is much larger than even the defence expenditure of the government. Debt service payments of the central government (in the 1998–9 union budget) added up to more than its revenue from excise duties! The situation has grown worse since the budget since indirect tax collections have fallen far short of projections. Direct monetization of the deficit through ad hoc treasury bills was abandoned in favour of 'ways and means advances' in 1994.

Some characteristics of public expenditure patterns in India are collected in Table 10.2.

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in income but, since we need to tax monopoly profits as well, a corporate tax should be put in place. But since dividend has already been taxed as income, the corporate tax rate can be low.

[9] One of the advantages of a single rate VAT is that it does not distort relative prices at earlier stages of production. This advantage would be compromised if a multiple rate VAT were to be introduced.

TABLE 10.2

Characteristics of Expenditure Patterns of Central and State Governments

Item	Central government expenditure (unless otherwise stated)						
	1985–6	1993–4	1994–5	1995–6	1996–7	1997–8 (revised estimates)	1998–9 (budget estimates)
RDE/TRE	43.3	40.9	40.7	37.5	37.0	37.1	37.8
CDE/TCE	37.1	17.9	20.2	15.2	13.0	17.1	21.6
TRE/(TRE+TCE)	65.1	76.9	76.6	79.0	79.6	78.1	79.0
TRE+TCE (Rupees crore)	53,808	146,050	165,205	183,059	206,414	242,504	276,233
TRE+TCE (constant 1981–2 prices)	42,909	79,939	66,668	66,639	69,781	77,083	—
Gross fiscal deficit (GFD) of GOI (Rupees crore)	21,857	60,257	57,704	60,243	66,733	86,345	91,025
GFD of GOI as percentage of GDP	8.3	7.4	5.9	5.3	5.2	6.16	—
GFD of state government (Rupees crore)	—	—	—	—	37,444.4	51,048.9	—
GFD of state government as percentage of GDP	—	—	—	—	3.3	3.6	—

Notes: TRE = total revenue expenditure, TCE = total capital expenditure, RDE = revenue development expenditure, CDE = capital development expenditure, GOI = Government of India.

Source: Author's calculations based on *India: Public Finance Statistics*, various issues and *Report on Currency and finance*, RBI, 1997–8.

The development component of both capital and revenue expenditures seems to be falling off over time. It has tended to pick up a bit since 1997 but the revenue component of total expenditures has continued to rise sharply. Thus one important characteristic of public expenditure in India has been the rising dominance of the current as opposed to the capital component. This is broadly consistent with the description of 'stages of public expenditure growth' outlined above.

One important reason for the ballooning of revenue expenditures is the uncontrolled expansion of subsidies. Subsidies in India take diverse forms. There are *cash subsidies* (e.g. on food, fertilizer, and export); *interest or credit subsidies* wherein loans are given at lower than market rates of interest; *tax subsidies* (e.g. tax exemption of medical expenses, deducting mortgage interest payment from taxable income, tax exemption for charitable institutions and contributions to them); *in-kind subsidies* (e.g. provision of free medical services or food to target groups in the population); *equity subsidies* (tax exemption for investment in public enterprises giving low dividends); *procurement subsidies* (e.g. purchase of foodgrains at assured, higher than market prices); and *regulatory subsidies* (fixation of price/quantity in the case of goods produced by the public/private sector, e.g. petroleum subsidies). The economic effects of subsidies can be grouped under various headings: (i) allocative effects which relate to the effects of subsidies on the allocation of goods and services, (ii) redistributive effects which relate to the differential effects of subsidies on different income classes, (iii) fiscal effects on the budget, and (iv) effects on internal as well as international trade. A classification of subsidies of more immediate relevance to us is *merit* and *non-merit* subsidies. The former are clear cut cases of social value of an activity or product being greater than the private value whereas the latter are less defensible. For 1994–5 it has been estimated (Ministry of Finance, 1997) that non-merit subsidies (e.g. on food, fertilizers, and education beyond the elementary stage) are more than five times the merit subsidies (e.g. on roads, bridges, other public goods, and defence).[10] Non-merit subsidies net of surplus for the central government alone were of the order of Rs 31,523.22 crore. The recovery rate for non-merit subsidies was only 53 per cent. For fifteen of the larger states non-merit subsidies net of surplus were Rs 48,337.58 crore implying a recovery rate of just 14.04 per cent. The corresponding all India recovery rate is just 32.59 per cent. If the non-merit subsidies net of surplus for central and state governments are added up, the figure comes to 9.86 per cent of GDP for 1994–5. In other words, non-merit subsidies net of surplus

[10] Merit subsidies are those that lead to the development of social infrastructure that would otherwise have been difficult. Non-merit subsidies are those that are either pure consumption subsidies (e.g. on food) or are best provided with appropriate user charges (e.g. on higher education).

amount to more than the fiscal deficits of the central and state governments combined! One sure way of reducing fiscal stress in India is to target reductions in non-merit subsidies. The funds released can be used to retire the accumulated public debt and increase public investment in the social infrastructure sector. In addition to the overall scale of the subsidies being reduced, the entire subsidy structure needs to be made transparent. The policy authorities need to be clear about the role and objectives of subsidies. If subsidies are to be given to select groups (such as low income classes) then these subsidies have to be on final goods and should be well targeted so that their welfare effects can be maximized. A generalized subsidy on kerosene, for example, does not serve this purpose. In addition, subsidies should be periodically reviewed and it should be made clear that subsidies are not intended to be permanent.[11]

The unchecked growth of the revenue element of public expenditure has had three very deleterious effects on the Indian economy. First, it has led to a drop in the rate of public capital expenditure. This is extremely important since there are large parts of social infrastructure that can only be publicly financed. This set would include rural and many urban roads, irrigation and power projects, and investment in human capital. One cannot imagine, for instance, the private sector playing a significant role in the development of (sorely needed) rural infrastructure. Second, it has led to a high interest rate regime wherein higher government borrowings have tended to push up interest rates (particularly long-term ones) and fuel inflationary expectations (through the Fisher effect,[12] see Jha, Meyer, and Sahu, 1990). This has meant that India has had to have higher inflation and interest rates than our major trading partners. No doubt, this has contributed to industrial stagnation. Third, despite protestations to the contrary, this period has reduced the rate of growth of transfers that the central government makes to state governments. So just at the time that the need to increase central transfers to states and for greater decentralization of fiscal authority is felt, the amount of resources that can actually be transferred is dwindling. This situation has now assumed alarming proportions and calls for immediate correction.

SOME IMPORTANT CONSEQUENCES

The feedback effect of high deficits into high interest rates which then lead to higher costs of deficit financing and then higher deficits, thus completing a vicious cycle, has been known for quite some time. In the Indian context, a warning against the effects of higher government borrowing was given at least ten years ago (Jha and Kasturiya, 1988; Kasturiya, 1988). Later work (Buiter and Patel, 1992, 1997; Jha, 1998) tended to put the emphasis on sustainability of budget deficits. The analytics of this are quite complex but the basic intuition can be explained quite simply. In the context of a government running a deficit, in the long run if current tax revenues are unrelated to public expenditures (net of interest payments on accumulated debt) then the gap between expenditures and revenues will pile up at higher and higher rates over time. In finite time, then, the government will become bankrupt.

Recent research (Buiter and Patel, 1992, 1997; Jha, 1998) seems to indicate that the current budgetary stance of the government is non-sustainable in the above sense. In other words, even with maximal use of seignorage revenue,[13] the government runs the risk of becoming technically bankrupt in finite time. If a concerted effort is not made to bring current expenditures in line with current revenues, this process will be compounded by higher interest rates, slow industrial growth, and lower transfers to state governments with considerable and growing fiscal stress both at central and state levels.

The fact that government finances were in trouble has been known, as argued above, for at least ten years. Awareness of this problem was low, until very recently, because of fixation with the ratio of gross fiscal deficit (of the central government) to the GDP. This ratio is not the only point of concern even when the focus is narrowly on the sustainability issue. There should be equal concern about the absolute level of the debt and the interest rate consequences of such borrowings. Once we extend our concerns beyond sustainability, we would have to worry about the effects of this on industrial growth, on intergovernmental transfers, inflation, and last, but not least, public accountability. The facts that central government borrowings this year will be higher than budgeted, that transfers to the states will be frozen at budgeted levels, and that the deficit target will not be met are bad enough. It should also be remarked that the structural adjustment programme initiated in 1991 at the behest of the IMF controlled the central government's deficit by reducing transfers to the states and by reducing public sector capital formation. Soon, as commitment to the IMF's austerity programme was no longer necessary (after the loan was paid off[14]), the deficit started to slip again as early as 1993–4).

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[11] Another important aspect of subsidies as related to administered prices is that such prices often lead to economic inefficiency. A prime example of this is the case of fertilizer subsidies and the retention pricing mechanism. The retention pricing mechanism gives fertilizer producers a price that assures them a 'fair return' on their cost. Clearly, then, fertilizer producers will have no incentive to lower costs since they are offered a minimum rate of return, no matter what the cost. The government then turns around and sells fertilizers at highly subsidized rates to farmers. This leads to allocative inefficiency with input choices not reflecting their relative prices. Empirical confirmation of this can be found in Jha and Sahni (1993).

[12] The real interest rate is determined by the long-term marginal product of capital (assumed given in the short run) in the economy, and the nominal interest rate equals the real rate of interest plus inflationary expectations. Then a rise in the nominal interest rate would imply a rise in inflationary expectations.

[13] Seignorage revenue is the revenue that the government obtains by virtue of its monopoly on printing currency. Clearly, the revenue from this source will depend upon the public's willingness to hold currency. This willingness may decline rapidly when this mode of financing of government deficits leads to high inflation and rapid erosion of the value of the currency. Gresham called this 'debasing' the currency.

There is one more important consequence of high government deficits and borrowing that should be mentioned (albeit briefly). As government borrowings rise to very high levels the climate for the conduct of monetary policy worsens considerably. There are several routes through which this works and two may here be mentioned. First, part of the deficit may be monetized. This then leads to an erosion of the independence of monetary from fiscal policy since a change in the deficit has direct implication for a change in the monetary base (Jha, 1994, Ch. 14). Second, the higher interest rate feeds into higher inflation rates through the Fisher effect, as explained earlier. It then becomes a struggle to maintain the value of the real interest rate. If the central bank wants to maintain relative exchange rate stability, as apparently it does in the Indian context, then it becomes necessary to maintain high interest rates. This feeds back to poor investment performance, rising debt service payments, and low economic growth.

SOME POLICY SUGGESTIONS

What steps can be undertaken to arrest this slide? Action has to be taken on several fronts simultaneously. First, an effort has to be made to raise the tax and non-tax revenues of the government in an efficient and transparent manner (more on that later). Second, current expenditures of the government have to be lowered so that the pressures on the interest rates are lowered. Third, the sluggishness in public capital expenditure has begun to act as a deterrent to further rapid economic growth. It is imperative that capital expenditures be increased. Hence the government has to be prepared to initiate a phase where capital expenditures grow faster than current expenditure and overall fiscal deficit declines. Thus a judicious mix of expenditure reduction and expenditure switching policies is called for.

While recommending increased capital expenditures by the government, we should be careful to insist upon a high degree of productivity of such expenditure. The element of waste must drastically be cut down. State governments can legitimately undertake much of this expenditure. It would be important to supervise and recommend such expenditure and ensure its coordination and harmonization across state boundaries.

As has already been pointed out, one sure way of reducing fiscal stress in India is to target reductions in non-merit subsidies. The funds released can be used to retire accumulated public debt and increase public investment in the social infrastructure sector. In addition to the overall scale of subsidies being reduced, the entire subsidy structure needs to be made transparent.

Where the public sector is bound to be present (say in industries with natural monopoly characteristics), an appropriate pricing policy should be pursued. For example, efficiency would require that cross-subsidization in industries producing joint products[15] should gradually be eliminated (Jha, 1998, Ch. 17; and Jha, Murty, and Paul, 1988). This would include, for example, the elimination of subsidy on second class travel in train by first class passengers and that on the post card from other postal items. As far as possible, the pricing mechanism should not be used as a mechanism for redistribution. The deleterious effects on resource allocation are far more serious than the benefits of such generalized tampering with the working of the price mechanism. It is widely accepted now that redistribution is best effected through the direct tax structure and social services.

Tax Reform

The experience of some other developing countries has shown that it is possible to proceed along the lines suggested by the theory of tax reform and obtain a degree of success. The theory of tax reform typically calls for a mix of personal income taxes and indirect taxes based on final consumption not intermediate uses. Additional excise taxes are to be levied on products and processes causing significant external diseconomies. Taxes on final consumption, if administered appropriately, will not significantly alter relative market prices and, therefore, will cause minimal distortion. Typically this calls for a VAT or, as in the case of India, a properly harmonized central and state VAT. But considerable planning and education of taxpayers has to be done before this programme can be put in place.[16] To reduce the significance of tax distortions the share of these indirect taxes should fall over time. The share of personal taxes in total tax revenue should rise as the economy grows since this ensures both growing redistribution from higher to lower income groups and gradual reduction of the distortion associated with indirect taxes. It is also warranted that the share of corporate taxes fall. The justification for corporate taxes lies only in their being taxes on monopoly profits or incomes of foreigners. These need not be too high. The fact that they are so high in India points to the possibility that there is widespread evasion of income taxes. Corporate taxes are easier to levy and collect than income taxes. Similarly, import duties need not be so high—since the only tenable (and that too weakly so) hypothesis in favour of import duties is the infant industry argument. Income and other direct taxes should be broadly based, administered by the central government, and should involve mild progression and a limited number of rates. An effort should also be made to index tax liabilities to the rate of inflation so that 'bracket creep' does not increase real tax burdens when real (gross of tax) incomes have remained unchanged. Typically, then, tax reform would call for gradual reduction in the role of excise and customs duties as well as corporate taxes and an increase in the share of other direct taxes, particularly the income tax. In all cases, a lowering of the tax rates and broadening of the tax base through plugging of loopholes and reductions of exemptions are called for. The above brief account of the trends in taxation in India should point clearly to the fact that there is considerable room for improvement.

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[14] The IMF loan was paid off well before schedule.

[15] The term 'joint products' is also to be interpreted as goods that share fixed cost, such as first and second class travel sharing the fixed cost of the railway network.

The tax reform measures outlined above and reforms of public expenditure and the price/subsidy mechanism will, unfortunately, have the short-run effect of increasing some hardships for the poor. There is no escaping this, and it must be accepted and planned for in a serious manner. If tax rates on the rich are to decline there must be a commensurate increase in tax compliance and sharp reductions in tax evasion. In this context, it is important to reiterate that the tenets of income tax reform apply to *all* income. Effort must be made to bring agricultural income under the purview of taxation[17] and reduce the exemptions allowed. Otherwise, tax reform will remain unfair and become, ultimately, untenable. Tax reform theory *does not* say that we should reduce marginal tax rates on some of the income and exempt a large source of income from taxation. Selective use of the tenets of tax reform theory to justify tax changes may be misleading. With a fair tax system that encourages economic growth, tax revenues might rise high enough to make possible the provision of essential social services on a large enough scale.

An important consideration is the ability of the tax structure to attract new capital into the Indian economy and to prevent capital flight from the economy. Whereas quantitative controls are not advisable, the design of corporate tax rates should at the same time make India a competitive destination for equity capital and reduce the risk associated with large-scale borrowing from abroad. A stable macroeconomic environment with low inflation, well-functioning capital markets, relatively stable exchange rates, and manageable government debt is very important for this. The tax/expenditure system should work towards creating such an environment.

Another important issue is that of tax assignment. Which taxes should be levied by the central government, which by the state governments, and so on? Typically, mobile tax bases are taxed by the central government. This would include incomes, corporate profits, and goods. State governments would not be able to implement income tax properly, let alone build equity into it. However, in order to partially finance their expenditures state governments can be allowed to levy some commodity taxes provided these are well harmonized with central taxes so that the distortionary impacts are minimized. Decentralization of public expenditure is well accepted since local governments would better understand the needs of the population and be more accountable than the central government. This would imply that resources should flow from the central to state governments.

The area where there is co-occupation of the tax base by state and central governments is the commodity tax structure. As far as union excise duties are concerned there are two broad problems. The first arises from the fact that union excise duties are levied at manufacturer's level and exclude most major service items. The second problem deals with lack of harmonization of central taxes with state-level sales taxes. Some aspects of these problems can be redressed if the system switches over to a manufacturing-based VAT. (Some of these problems induced Canada to move from a manufacturers' sales tax to a federally administered VAT— the goods and services tax). In the Indian context, however, two caveats need to be added. First, the rate structure has to be well defined. Typically, VATs are enforced at a single rate. In the Indian context as many as three rates have been suggested. That would be self-defeating. It would be far better to have a single rate central VAT and impose additional excise duties on goods and services causing external diseconomies. The second caveat has to deal with harmonization of central and state-level VATs. If the central government is to impose a VAT and state-level tax structures are not well harmonized, the distortionary impacts may be as high as at present. The principal reason why state and central governments have not been able to harmonize tax structures is lack of trust. Part of this has to deal with some degree of arbitrariness in the determination of central transfers to state governments.[18]

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[16] A VAT without proper taxpayer education and administration could involve considerably more bureaucracy than an excise duty. Checking this would be an important constituent of the tax reform agenda.

[17] There have been some suggestions that the agricultural incomes of those whose incomes from the non-agricultural sector are more than some cut off figure should pay some tax on their agricultural incomes. This is a step in the right direction. The best solution, however, is to tax agricultural income directly.

A positive development in this connection was the recommendation of the Tenth Finance Commission that all central government revenues be shared with state governments. Previously, when this was not the case, the central government was lax in collecting those taxes whose proceeds were to be shared with state governments. Now the central government has uniform incentive to collect all taxes.

In the case of state governments, Jha et al. (1999) discovered that higher grants make state governments lax in their tax collection efforts. Apart from tax capacity factors, which have a direct bearing on the amount of revenue that a state can collect at a given tax rate, tax performance depends on the state government's revenue effort manifested in administrative and legislative efforts to expand the tax base, rationalize tax structure, and reduce avenues of tax avoidance and evasion. However, the flow of resources to the government through growth in tax capacity factors, or what is referred to as the built-in elasticity of the tax system, is often inadequate. It is in this context that the 'tax effort' of states assumes critical importance for garnering resources for development. This apart, a sound tax system presupposes a certain degree of efficiency in tax collection.

State governments in India, by virtue of the very diverse economic conditions, collect different proportions of their gross revenue through their own resources, while the remaining part is met through transfers from the centre. If the weight on tax effort in the formula for devolution of central funds to states was to be reduced to zero, the incentive for a state to achieve higher tax effort, from the point of view of receiving higher levels of central transfers, would be completely absent. It also appears to be the case that state-level efficiencies in tax collection do not converge over time. Thus the gap between more efficient and less efficient states is widening rather than declining. It is also important to note that it is not true that the richer states are uniformly more efficient in tax collection than poorer states. Thus incorporation of the efficiency consideration may not discriminate against the poorer states.

In recent times, considerable concern has been voiced about the level of fiscal deficit of the central government. One way that the central government has chosen to reduce this deficit is to reduce grants to states. Against this backdrop, improvement in the tax effort of Indian states assumes a degree of urgency.

Hence a programme of tax reform at state level must, apart from designing tax structures, pay attention to tax effort defined as the excess of tax revenues raised by state governments over and above what could be accounted for by activity variables such as state domestic product and level of industrialization, as in Jha et al. (1999). For increasing the weight on tax effort in the formula for devolution of funds from the central to the state governments is a ready policy tool to induce states to put in more tax effort. Tax design, in itself, must follow strict harmonization with central taxes.The extent of tax-induced distortions is higher in India than in any other large federation (Vallaincourt, 1992). Effort must urgently be made to reduce these distortions.

In this context passing mention might be made of local-level finances. It is imperative that there be no quantitative restrictions on the flow of goods and services within the country. Recent research (Jha et al., 1997) has pointed out that India is one integrated market. The advantages of India as a common market need to be exploited. As mentioned above, local-level taxes need to be harmonized with reference to state and central taxes. Property taxes need to be rationalized on an urgent basis. Octroi and similar distortionary taxes should be eliminated and the system of transfers from state to local governments should be made transparent and responsive to efficiency improvements at the level of local government. Moderate user fees need to be introduced for most municipal services in order to retrieve part of the cost as well as to discourage wasteful use. Considerable administrative and managerial improvements will have to be effected in order to realize these aims.

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[18] It is beyond the scope of this chapter to analyse this issue at any length. Interested readers may want to see Jha, Anand, and Gupta (1999).

SUMMARY AND CONCLUSIONS

The following points can be made by way of summary.

- Overall public expenditure to GDP ratio must decline.
- Capital component of public expenditure must go up whereas the revenue component should decline.
- Direct taxes must be levied by the central government. Income tax rates should be lowered and the tax base widened. The possibility of tax averaging (whereby people with fluctuating incomes avoid paying too much tax when their incomes are high and are permitted a reasonable reduction in tax liability when their incomes are low) and tax indexation should be studied.
- Corporate tax rates should be low and competitive.
- The overall tax–GDP ratio and the share of direct taxes in overall tax collected should rise.
- Share of indirect taxes should fall. The central government should move toward a one tax rate VAT. State governments should legislate harmonized VAT structures. In case this is difficult to attain, more tax powers should be transferred to the central government with a higher portion of central tax collections shared with the states. Import tariffs should be low and quotas eliminated.
- The level of non-developmental subsidies should be reduced.
- The administered price regime should be dismantled. Public sector undertakings selling joint products should follow cross-subsidy free pricing structures.
- The rules for devolution of central tax revenues to the states must be transparent. The proceeds from all central taxes should be shared with states.
- Incentives should be built into the devolution formula to encourage increased tax effort by state governments.
- All quantitative restrictions on internal trade should be removed. Local governments should be given transfers by state governments in a transparent manner. Property taxes should be rationalized. Octroi should be removed. Appropriate user fees for municipal services should be levied.

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APPENDIX TABLES

TABLE A10.1

Tax Revenues as a Percentage of GDP 1990–6

Country group	1990	1991	1992	1993	1994	1995	1996
East Asia & Pacific	8.91	8.54	8.27	7.69	10.00	9.58	—
Europe & Central Asia	—	—	—	—	23.00	—	—
High income: non-OECD	—	—	—	—	—	—	—
High income: OECD	22.44	23.84	23.55	23.64	25.11	25.67	—
High income	22.35	23.72	23.45	23.55	24.99	25.60	—
Latin America & Caribbean	15.32	14.90	14.96	15.78	—	—	—
Least developed countries: UN classification	—	—	—	—	—	—	—
Low & middle income	—	—	—	—	15.02	—	—
Low income, excl. China & India	—	—	—	—	—	—	—
Low income	8.17	7.76	7.47	6.63	8.11	8.02	—
Lower middle income	—	—	—	—	16.50	15.15	—
Middle East & North Africa	—	—	—	—	—	—	—
Middle income	—	—	—	—	—	—	—
South Asia	11.22	11.20	10.99	9.83	10.28	10.87	10.63
Sub-Saharan Africa	—	—	—	—	—	—	—
Upper middle income	17.94	16.57	16.65	18.72	—	—	—
World	20.89	22.11	22.45	21.92	23.04	23.34	—
India	10.75	10.92	10.57	9.23	9.68	10.05	10.46

Note: The classification of the country groups is as per the definitions of the World Bank.
Source: World Bank.

TABLE A10.2

Taxes on Goods and Services as a Percentage of Current Revenue 1990–6

Country group	1990	1991	1992	1993	1994	1995	1996
East Asia & Pacific	23.71	25.85	26.04	25.64	28.07	26.36	—
Europe & Central Asia	—	—	—	—	—	—	—
High income: non-OECD	33.44	37.07	21.14	20.59	23.47	—	—
High income: OECD	28.40	27.94	26.88	26.83	28.79	28.23	—
High income	28.48	28.69	26.68	26.60	28.37	28.23	—
Latin America & Caribbean	30.38	29.95	35.79	34.69	37.36	40.28	—
Least developed countries: UN classification	—	—	—	—	—	—	—
Low & middle income	—	26.91	30.93	29.24	—	—	—
Low income, excl. China & India	—	—	—	—	—	—	—
Low income	—	—	—	—	—	—	—
Lower middle income	24.46	24.93	26.15	27.98	30.55	36.49	—
Middle East & North Africa	16.53	14.85	16.52	12.97	11.76	10.46	—
Middle income	24.72	24.64	27.24	29.11	30.59	33.91	—
South Asia	35.92	35.75	36.01	36.33	35.51	38.59	40.00
Sub-Saharan Africa	—	—	—	—	—	—	—
Upper middle income	27.78	24.64	30.44	31.12	30.59	32.09	—
World	27.57	27.53	29.05	28.04	29.21	—	—
India	36.13	34.80	33.48	32.11	31.53	29.03	27.84

Note: The classification of the country groups is as per the definitions of the World Bank.
Source: World Bank.

TABLE A10.3

Taxes on Income, Profits, and Capital Gains as a Percentage of Current Revenue 1990–6

Country group	1990	1991	1992	1993	1994	1995	1996
East Asia & Pacific	30.75	33.32	31.54	39.77	31.15	32.95	—
Europe & Central Asia	—	—	—	—	—	—	—
High income: non-OECD	25.61	26.96	30.03	28.91	27.58	—	—
High income: OECD	33.97	31.88	32.48	31.04	31.50	27.66	—
High income	33.08	31.57	32.14	30.69	31.23	27.66	—
Latin America & Caribbean	17.47	18.23	16.51	16.16	16.82	17.27	—
Least developed countries: UN classification	—	—	—	—	—	—	—
Low & middle income	—	21.35	18.87	19.80	—	—	—
Low income, excl. China & India	—	—	—	—	—	—	—
Low income	—	—	—	—	—	—	—
Lower middle income	22.94	23.78	21.55	20.59	19.85	16.99	—
Middle East & North Africa	21.32	20.34	19.69	16.28	16.70	15.77	—
Middle income	21.82	21.89	20.22	19.14	19.50	17.27	—
South Asia	10.82	12.00	12.91	14.51	14.78	14.32	14.19
Sub-Saharan Africa	26.56	—	—	—	—	—	—
Upper middle income	19.20	17.76	17.34	17.54	19.36	19.04	—
World	23.41	24.13	21.10	22.57	21.81	—	—
India	14.96	17.45	17.94	19.80	21.81	22.04	22.12

Note: The classification of the country groups is as per the definitions of the World Bank.
Source: World Bank.

TABLE A10.4

Central Government Total Debt as a Percentage of GDP 1990–6

Country group	1990	1991	1992	1993	1994	1995	1996
East Asia & Pacific	—	—	—	—	—	—	—
Europe & Central Asia	—	—	—	—	—	—	—
High income: non-OECD	—	—	—	—	—	—	—
High income: OECD	38.32	38.39	41.65	52.22	52.84	54.84	—
High income	43.95	40.94	42.05	52.34	55.12	60.67	—
Latin America & Caribbean	—	—	—	—	—	—	—
Least developed countries: UN classification	—	—	—	—	—	—	—
Low & middle income	—	—	—	—	—	—	—
Low income, excl. China & India	—	—	—	—	—	—	—
Low income	—	—	—	—	—	—	—
Lower middle income	—	—	—	—	—	—	—
Middle East & North Africa	—	—	—	—	—	—	—
Middle income	—	—	—	—	—	—	—
South Asia	54.63	6.669	62.99	65.28	66.56	66.20	63.28
Sub-Saharan Africa	—	—	—	—	—	—	—
Upper middle income	—	—	—	—	32.60	37.30	—
World	—	—	—	—	—	—	—
India	54.63	53.70	53.57	55.99	53.44	52.21	50.19

Note: The classification of the country groups is as per the definitions of the World Bank.
Source: World Bank.

TABLE A10.5

Overall Budget Deficit, including Grants, as a Percentage of GDP 1990–6

Country group	1990	1991	1992	1993	1994	1995	1996
East Asia & Pacific	—	—	—	—	—	—	—
Europe & Central Asia	—	—	—	—	-7.68	—	—
High income: non-OECD	—	—	—	—	—	—	—
High income: OECD	-3.209	-3.202	-4.043	-4.381	-4.151	-3.418	—
High income	-3.201	-3.199	-4.025	-4.354	-4.121	-3.403	—
Latin America & Caribbean	-6.262	-1.362	-2.619	-5.809	—	—	—
Least developed countries: UN classification	—	—	—	—	—	—	—
Low & middle income	—	—	—	—	—	—	—
Low income, excl. China & India	—	—	—	—	—	—	—
Low income	—	—	—	—	—	—	—
Lower middle income	—	—	—	—	-4.92	—	—
Middle East & North Africa	—	—	—	—	—	—	—
Middle income	—	—	—	—	—	—	—
South Asia	-8.130	-6.946	-6.511	-7.843	-6.843	-6.175	-5.745
Sub-Saharan Africa	—	—	—	—	—	—	—
Upper middle income	-7.04	-2.33	-3.57	-6.56	—	—	—
World	-3.45	-3.15	-3.96	-4.41	-4.14	-3.33	—
India	-8.11	-5.81	-5.65	-7.47	-5.95	-5.98	-5.13

Note: The classification of the country groups is as per the definitions of the World Bank.
Source: World Bank.

TABLE A10.6

Short-term Debt as a Percentage of Total External Debt 1990–6

Country group	1990	1991	1992	1993	1994	1995	1996
East Asia & Pacific	16.10	17.90	20.00	21.50	21.20	24.00	25.10
Europe & Central Asia	18.70	16.60	16.60	13.70	11.50	12.70	14.30
High income: non-OECD	—	—	—	—	—	—	—
High income: OECD	—	—	—	—	—	—	—
High income	—	—	—	—	—	—	—
Latin America & Caribbean	16.30	17.60	18.60	20.00	20.00	18.90	17.50
Least developed countries: UN classification	—	—	—	—	—	—	—
Low & middle income	16.70	17.10	18.30	18.40	17.40	18.00	18.40
Low income, excl. China & India	—	—	—	—	—	—	—
Low income	11.70	11.50	12.50	11.70	11.40	12.80	13.50
Lower middle income	—	—	—	—	—	—	—
Middle East & North Africa	24.10	24.80	27.90	28.00	24.10	22.40	22.30
Middle income	18.70	19.30	20.60	21.00	19.60	19.90	20.10
South Asia	9.50	8.70	7.90	4.10	4.30	5.80	6.80
Sub-Saharan Africa	14.30	14.10	15.80	17.80	15.40	16.50	17.40
Upper middle income	—	—	—	—	—	—	—
World	—	—	—	—	—	—	—
India	10.21	8.28	7.02	3.84	4.16	5.35	7.49

Note: The classification of the country groups is as per the definitions of the World Bank.
Source: World Bank.

11 Tax Evasion, Amnesty Schemes, and Black Income: Theory, Evidence, and Issues

Shikha Jha

INTRODUCTION

Benjamin Franklin once said, 'Nothing is certain except death and taxes.' We are familiar with how the *zamindars* made sure that the taxes 'due' to them were collected, by hook or by crook. Indeed tax collectors in late eighteenth- and early nineteenth-century Britain were referred to as 'highwaymen'. The efficiency of their tax enforcement is comparable to that with which the underworld mafia is raising extortion money in recent times. Should we aim to, and if so is our tax authority well equipped to, match this level of performance? Field evidence from various (developed) countries indicates to the contrary.[1] In India in 1980, tax evaded income exceeded assessed income by 140 per cent.

Measures often suggested to improve tax revenue collections include lower rates, broad base, and better administration, and enforcement. An important but seldom discussed aspect is factors influencing tax evasion leading to unreported income and consequent drain on the exchequer. Tax evasion leads to inefficiency through various costs in addition to revenue losses to the government. These include administrative costs of auditing and cost in terms of uncertainty faced by tax evaders as to whether they will be caught and penalized.[2] Evasion can erode the tax base and have an impact on the structure of prices and income. If present on a large scale, it can even distort the effectiveness of macroeconomic policy. This chapter reviews the literature on tax evasion in particular and black income in general with special focus on empirical studies in India and brings out some important and pressing issues that need immediate research.

The true impact of a country's tax system depends not just on how the system is designed but more importantly on how its tax laws are administered and enforced. An apparently highly progressive tax structure may actually be regressive if taxes levied on the rich are not collected. If tax laws are selectively enforced, it may produce an undesirable distribution of tax liabilities.[3] It may also provide an incentive for tax evasion. But there are other reasons too for tax evasion. Why and how much do people evade taxes? What are the implications of offering amnesties to evaders? What is the Indian evidence? If evasion continues to take place adding to the generation of black income, what could be the economic consequences? What can be done to curb tax evasion and control the generation of black income? These are some of the questions addressed in this chapter.

The rest of the paper is organized as follows. The second section reviews some theoretical models of tax evasion. The third section summarizes the results

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[1] In most countries reported income is 60–80 per cent of the taxable amount among the taxpayers that underreport. In the USA, non-compliance with individual and corporate income tax comprises more than 20 per cent of tax liability. In Spain, 68 per cent of income is concealed under personal income tax. In Sweden 10–30 per cent of the population is involved in tax evasion, which forms 4–7 per cent of GDP.

[2] However, high penalty or effective enforcement through auditing can reduce the level of tax evasion.

[3] The following quote pertaining to early twentieth-century India emphasizes this point. 'It was asking too much of a *Tahsildar* to expect him to assess rich men properly. He is inevitably afraid of the rich and influential, and also nervous of the suspicion of personal animosity or corruption. The tax therefore fell with much greater sharpness on the poorer section of the assessees' (Rao, 1931, 39).

obtained from some recent empirical studies on tax evasion and compliance in India. The usefulness of amnesty schemes and other methods to reduce evasion is also discussed in this section. The next section discusses various possible consequences of the presence of black money in the economy. The fifth section contains a discussion of various approaches and estimates of black economy in India. Finally, the sixth section lists possible ways of improving compliance.

MEASURING TAX EVASION

What is tax evasion? Loosely speaking, one can say 'The law attempts to specify a portion of your resources to which the state is entitled; evasion is a violation of that entitlement' (Cowell, 1990, 13). Thus tax evasion is an illegal activity. This is different from the legal activities of tax planning (e.g. with the help of a tax consultant) and tax avoidance (using certain loopholes in the system to avoid paying taxes). One could say that *an economy breathes through its tax loopholes*.

Why do people evade taxes? There are several economic and non-economic reasons. These include a habit of breaking rules, political dissent, and to score against prior injustice or an oppressive or unfair tax regime. The most important economic reason is that it pays to evade taxes. Other reasons include the notion that the tax code affects the economic opportunities of taxpayers and it is impossible to tie one's contribution to specific uses. Tax evaders could perceive the worth of uses to which public funds are put to be low. They perhaps know that they can get away with it (with future amnesty schemes) or evade in the hope that others will pay up.

One of the first papers on income tax evasion showed that under fairly general conditions, a taxpayer would definitely evade taxes (see Box 1). However, casual observation shows that many taxpayers fully comply with their tax obligations. This is at variance with the above result and has hence led to what is termed as *the puzzle of (full) tax compliance*. Many researchers have tried to solve this puzzle both in terms of providing economic and non-economic explanations and building better models mathematically to account for the observed phenomenon. A number of subsequent studies have pointed to the empirical evidence of 100 per cent tax compliance, at least by some taxpayers. Individuals have been shown to exhibit much diversity in their behaviour. Several social, psychological, moral, and other non-economic explanations—such as stigma, ethical norms, or moral sentiments—have been provided to explain the observed tax compliance. There is also evidence that individuals pay taxes because they value

Box 1
Economic Rationale for Tax Evasion

Taking economic considerations alone into account, direct or income tax evasion has theoretically been modelled as a gamble: the taxpayer has no sense of duty, honour, or responsibility to the state, and is prepared to evade the due taxes if it is financially worthwhile. The most elementary model of tax evasion considers a rational taxpayer faced with a choice under risk. The taxpayer has complete knowledge about his/her own financial resources, the taxes he/she should pay, the tax legislation, and the penalty for getting caught and convicted of failing to pay. He/she is also aware that the tax authority cannot know his/her true tax liability unless fully reported or found out by the authority at some cost. The taxpayer thus has an incentive to evade.

How much income should a taxpayer report? To what extent is it worth taking the chance of being caught and penalized? In a seminal paper, Allingham and Sandmo (1972) showed that 'a risk averse taxpayer, maximising expected utility will *always underreport* income if the expected return per rupee of evaded tax is strictly positive'. A higher risk aversion leads to lower evasion, other things remaining unchanged.

Such a model is formally built as follows. The taxpayer maximizes expected utility from income over two possible states: one in which evasion is not detected and the other in which it is detected and a penalty (at a rate higher than the tax rate) paid proportional to the amount of tax evaded. The rate of penalty is, for example, 0.5 in the USA and 2 in Italy. The expected return on a rupee of evaded tax is the weighted average of this rupee (if not detected) and the penalty (if detected with a given probability). Fiscal systems of (most) developed countries imply that the value of this expected return lies between 0.75 and 0.99 (see Bernasconi, 1998), which is definitely positive as required by the result of Allingham and Sandmo. Hence we should expect all taxpayers to evade, however small the amount of evasion may be. But these results are at variance with empirical evidence; we do find people with 100 per cent tax compliance. Also, in practice, penalties are usually non-maximal for most offences. In fact, amnesties represent a lowering of penalty rates for past tax evasion.

Box 2

Resolving the Tax Compliance Puzzle

The puzzle is: Why do people pay taxes when they have both the opportunity and the incentive to evade? Mehra and Prescott (1985) showed that the Allingham and Sandmo type of result on tax evasion, based on expected utility maximization, requires a coefficient of relative risk aversion around 30. However, previous estimates and theoretical arguments indicate its value to be between 1 and 2. With a coefficient of 30, a person with an income of say Rs 75,000 would be willing to pay an enormous premium of about Rs 24,000 to avoid a gamble of winning or losing Rs 25,000 with equal probability! Epstein (1992) showed a more general result that with very high relative risk aversion, the expected utility model implies enormous risk premiums for large gambles. It implies almost zero premiums for moderate risks at low levels of the coefficient.

The (objective or actual) probability of detection has been estimated to be between 1 and 3 per cent for most countries. However, the subjective probability (as perceived by taxpayers) has been found to be much higher at 9 per cent according to a survey of US taxpayers' assessment. This means that even if individuals maximize expected utility, they do so with their own subjective probabilities. In particular, research in cognitive psychology has shown that a small change in probability has a bigger impact when it changes the state of an event from impossible ($p = 0$) to possible ($p > 0$) or from possible to certain ($p = 1$). This can happen, for example, if audit is introduced in a tax system with a previous policy of no audit. Similarly, such an effect can be seen when all taxpayers are audited compared to a previous system of, say, random audit.

More recent literature has attempted to resolve the puzzle using theories of *generalized expected utility* and non-expected utility. For instance, Bernasconi (1998) uses a weighting function, which reassigns the probabilities associated with different events. The exact function that she uses is obtained from an estimate of a 'representative agent best-fitting model'. The parameters of this function are based on experimental data from various studies conducted across the world. When these new weights or 'probabilities' are used to obtain 'expected utility' what we get is the model of 'expected utility with rank dependent probability' (EURDP). This model ranks various outcomes from the 'smallest' to the 'largest' and the probabilities are reassigned according to this rank ordering of outcomes. Bernasconi shows that the use of the weighting function even in the standard Allingham–Sandmo type of model does give 100 per cent tax compliance for very reasonable levels of parameter values. That is, tax compliance occurs because some individuals overweight the low probability of audit.

the public goods that their taxes finance. Recent literature using better modelling framework and supported by experimental evidence is capable of explaining full tax compliance (see Box 2). The evidence is indeed consistent with an excessive tendency to play safe, i.e. risk aversion is more prevalent than not.

Myles and Naylor (1996) build a framework to justify two alternative possibilities within the same economy in which a social custom utility is derived when taxes are paid honestly and there is a payoff from adhering to the standard pattern of social behaviour. They show that both equilibria with no evasion and with all taxpayers choosing to evade may exist in such a system. However, a small change in the tax rate in the no-evasion equilibrium may lead to 'epidemics of evasion'. Myles and Naylor also make predictions about how the proportion of evaders is affected by changes in the environment.

There are very few studies on indirect tax evasion. One of the reasons perhaps is that it is more difficult to model than income tax evasion. Another reason could be that indirect tax revenue is a small fraction of total tax revenue in most developed countries for which empirical studies are available. However, in a developing country commodity tax evasion is of significance as the share of tax revenue generated from indirect taxes is high. In India it is close to 60 per cent.

Taxes can be evaded both at manufacturer's level (excise duties) and at the time of sales (sales tax). The large number of categories of goods and types and sizes of exemptions and special concessions given allow manufacturers and sellers to misrepresent their goods as belonging to different categories and hence claim concessions and exemptions applicable to those categories. In this light the recent recommendation of the committee on excise structure to rationalize the rates into just three—5 per cent, 15 per cent, and 25 per cent—over the next five years is a welcome one. Indeed, one of the objectives behind this recommendation is to ensure better tax compliance.

Ray (1998) presents a succinct survey of research on both direct and indirect tax evasion. Most of the literature on commodity tax evasion considers it from the point of view of producers or sellers under different market structures (among others, see Virmani, 1989). Theoretical modelling of indirect tax evasion assumes that an industry reports only a portion of its actual sales and evades tax on the rest. As in the case of income tax evasion, it is assumed that the authorities audit a fraction of the firms and those caught cheating pay a certain fine to the government. The objective of a firm is then defined as the maximization of expected profit by optimally choosing how much of sales to report. Using data for 1977–8 Ray shows that underreporting of sales has a major impact on tax design. Optimal commodity taxes are 'more non-uniform' and 'more redistributive' in the presence of tax evasion than in its absence. A crucial factor underlying this result is the differences in magnitudes of own price elasticities of demand for different goods. If the cross-price effects are small, presence of tax evasion leads to higher optimal tax rates. There is also considerable non-uniformity across goods in optimal tax evasion by sellers. The higher the evasion, the larger is the absolute magnitude of tax and subsidy. A larger penalty for evasion leads to an increase in optimal sales reporting for milk and milk products; meat, fish and eggs; clothing and other non-food items. This last result is in line with that for income tax evasion in the Allingham–Sandmo framework.

IMPROVING COMPLIANCE: AMNESTY SCHEMES AND OTHER METHODS

The simple theoretical models discussed in the previous section have been used to study some testable propositions about tax rates, tax enforcement, and tax evasion for different countries. An appropriate empirical version of the model requires data on tax and enforcement parameters—such as tax base, tax structure including exemptions, assessments, penalties, and prosecutions and amnesties; and also data on personal and corporate income. Given these formidable data requirements, empirical studies based on the Indian tax system have been very few. But fortunately there have been a number of very successful attempts in recent years to analyse this system (e.g. Das-Gupta and Mookherjee, 1995a, 1995b, and 1998; and Subramaniam, 1996).

Das-Gupta, Lahiri, and Mookherjee (1995), who conduct an econometric study for the years 1965–6 to 1992–3, based on the Allingham–Sandmo theory, find that by international standards the performance of income tax collection in India has not only been poor but also deteriorating over time. Marginal tax rates and exemption limit significantly affect both revenue collected and tax compliance. In particular, the decline in compliance is explained mainly by higher effective tax rates and the declining frequency and quality of audits. Also, the principal tools of tax enforcement used in India—search and seizure activity and prosecution of tax offenders—have been ineffective in influencing levels of tax evasion. Das-Gupta, Lahiri, and Mookherjee define *best practice* for an enforcement variable to be that observed value which gives the highest level of revenue. But they find that even if such 'best practice' is followed for enforcement, assessment, and tax structure policies, tax revenue can rise at most by 90 per cent. This is well below the average for countries with similar per capita GDP and so other means of raising revenue have to be looked for.

There has been an attempt on the part of the government to reduce the maximum marginal tax rates (i.e. the rate applying to the highest income category) which have been brought down from a level of 97.7 per cent in 1973–4 to the current level of 30 per cent! This is accompanied by widening of the tax net by introducing various new criteria for compulsory filing of returns—such as ownership of cars, telephone connections, and foreign visits. (See Box 3 for details of recent tax measures.) However, as explained above, even with these changes, there is only limited scope for raising revenues. Further, whatever little has been achieved by way of improved performance of the government has been marred by its overenthusiastic follow-up of the amnesty schemes.

A tax amnesty is generally described as an offer of acquittal to tax evaders on voluntary declaration of evaded income and on payment of a fee based on these disclosures. As many as ten different amnesty schemes have been introduced in independent India (see Box 4). While such schemes were few and far between in the initial years, their frequency has increased several times in the 1990s.

Although the success of amnesty schemes has been judged by the amount of revenue realized during the year of the scheme (Table 11.1), there has been a negative influence on tax compliance. The expectation that such schemes would keep coming up in future leads to continued tax evasion. While the Kar Vivad Samadhan Scheme is announced as a one-time scheme, this does not rule out its clones from appearing in future as new governments take charge. These schemes are also perceived as being unfair to the honest taxpayers who bear relatively greater tax burden. By allowing tax evaders to evaluate their assets at prices prevailing several years ago, such schemes have helped the beneficiaries effectively pay much less taxes than is made out to be the case. This has been cited by 'honest' (read 'salaried') taxpayers who have to be content with 'tax-deduction at source' (TDS) as a bias against honesty. If disclosures under amnesty schemes were in terms of productive assets, leading to future generation of taxable income, it would better serve the tax authorities by widening their future tax base. The declarations in

Box 3

Recent Tax Measures: Carrots and Sticks

Kar Vivad Samadhan Scheme: 1998

It is a special scheme announced by the Finance Minister as part of the 1998 Budget proposals to settle certain categories of disputes involving arrears of taxes. 'The applicant will have to pay only 50 per cent of the amount of penalty, fine or interest due or payable on the date of making declaration. The balance amount of penalty, fine or interest due or payable will be waived.... The applicant will also get immunity from institution of proceeding for prosecution for any offence under any indirect tax enactment for matters covered by the declaration for the case.'

Samman Scheme: 1998

This scheme, also announced by the Finance Minister as part of the 1998 Budget proposals, was launched recently by the Central Board of Excise and Customs (CBEC). It intends to 'encourage voluntary tax compliance' and 'to stimulate/ encourage the efforts of its staff in meeting revenue target' by giving them *samman* or honour. The incentives are in terms of 'awards' for 'best revenue performance' among both taxpayers and staff. Persons eligible are all individual taxpayers falling in each of the three categories, i.e. business, profession, and salary, having a declared income of Rs 20 lakh or more in four out of five immediately preceding years. 'Every district or town where there is an income tax office should have a tax payer who has been awarded Samman.... The top taxpayer in the country, one in each of the three categories...shall be honoured with "Aayakar Ratna" at national level.' The awards for staff will be for revenue collection efforts, adjudication, audit and technical, legal and administrative matters, integrity, dedication, persuasiveness, and initiative.

Income Tax Rules: 16th and 25th Amendments, 1998 & 4th Amendment, 1999

The Permanent Account Number (PAN) or the General Index Registration Number (until PAN is allotted) needs to be quoted for all documents/transactions relating to the following.

- Sale/purchase of immovable property valued at more than Rs 5 lakh
- Sale/purchase of motor vehicle excluding two-wheelers
- Bank deposit/time deposit exceeding Rs 50,000
- Sale/purchase of securities with contract value exceeding Rs 10 lakh
- Opening a bank account
- Applying for a telephone (including cellular) connection
- Hotel/restaurant bills exceeding Rs 25,000

Those exempted from the above are agricultural income earners and non-resident Indians.
Source: Ministry of Finance.

the recent VDIS have, however, mostly been in terms of unproductive assets as shown in Box 5.

Based on panel data of a sample of 1836 taxpayers from over 50 rural and urban areas in Tamil Nadu during 1982–94, Subramaniam (1996) finds that income tax evasion is due to structural problems such as high marginal tax rates that are disincentives to report. Amnesty, bearer bonds, and voluntary disclosure schemes reduce the credibility of the tax system. The effect is enhanced by weak detection and penalty process. High inflation results in bracket creep. That is, since tax rates are applicable to nominal incomes, people tend to face higher rates due to inflation, even though their real incomes may not have changed. Subramaniam also finds that new and old, rural and urban taxpayers evade income taxes alike. Interestingly, while firms and corporations evade more taxes than individuals and Hindu undivided families (HUF), the assessees who are involved with searches, seizure, penalties, prosecutions, and VDIS evade even more taxes in the future.

In another study, Das-Gupta and Mookherjee (1995b) develop a theory to examine the role of amnesties in allowing taxpayers to launder assets accumulated by past tax evasion. They use a dummy variable technique to study the impact of amnesties on revenue using aggregate data from 1965 to 1993 and find that only the 1975 amnesty appears to have had a positive impact on revenue while others had negligible or even negative effects. In general, they find that adverse compliance effects of amnesties or falling penalty collection can even outweigh direct gains from an amnesty.

A better alternative for improving tax collection is a performance-based incentive scheme for tax collectors. However, such a scheme should be implemented with

Box 4

Tax Amnesties in India

1951	May–October 1951
1965	Finance Act 1965 (1&2) March–May 1965 & August 1965–March 1966
1975	Voluntary Disclosure Act 1976 October 1975
1980	Special Bearer Bond Scheme 1981
1985–6	Finance Act 1985
1991	Foreign Exchange Remittance Scheme & 3 schemes for domestic evaders — deposits with National Housing Bank — Gold Bond Scheme — Amendment 273A of Income Tax Act to give an opportunity to declare undisclosed income
1993	Gold Bond Scheme
1997	Voluntary Disclosure of Income Scheme (VDIS)
1998	Kar Vivad Samadhan Scheme

Sources: Das-Gupta and Mookherjee (1998); and Newspaper reports

TABLE 11.1

Magnitude of Temporary Amnesties in the Past

Year	Scheme	Tax rate (per cent)	Income disclosed (Rs crore)	Revenue yield (Rs crore)	Revenue as % of GNP
1951	N/A	N/A	70.2	10.9	1.00
1965	Finance Act	60	52.2	30.5	
1965	Finance Act (No. 2)	N/A	145	19.5	0.74
1975	Voluntary Disclosure Act	25–60	746.1	249	2.07
1981	Special bearer bonds	—	400	160	0.67
1985–6	Finance Act	—	2940	388	4.63
1991	Foreign Exchange Remittance Scheme + Gold bonds + 2 others	—	N/A	N/A	0.83
1993	N/A	N/A	N/A	N/A	0.17
1997	VDIS	30	33,000.0	10,050	0.79

Sources: Das-Gupta and Mookherjee (1998) and Barman (1998).

a caveat as discussed by Mookherjee (1998). He develops a theoretical model where the taxpayer evades and the tax collector gets a bonus under the *pay-for-performance* scheme. The bonus is a fraction of additional revenue generated through detection of evasion. Mookherjee shows that such a scheme will render the threat of over-assessment of evasion credible and therefore shift bargaining power towards the tax collector. The taxpayer can appeal against such over-assessment and receive a reimbursement from the tax collector if the appeal is successful. But if the cost of appeal is high and success rate low, and if judgements take a long time, the taxpayer may be deterred from appealing. In particular, the higher the bonus rate and appeal cost and the lower the rate of success of appeal and the reimbursement rate, the greater will be the magnitude of this effect. Under such circumstances, the tax collector will issue threats of over-assessment, collect 'extortion-based bribery' from the taxpayer and also receive the bonus from the tax authority.

Apart from amnesties, researchers have considered various ways of curbing evasion or improving compliance. In a study of the Dutch income tax, Elffers and Hessing (1997) show that deliberate over-withholding of taxes will further the tendency to comply. An alternative to enhance compliance is to offer the taxpayer a choice between full-itemized deduction and a considerable overall standard deduction. This will simultaneously reduce the efforts needed by tax authorities to prevent tax evasion. In addition to withholding, Tanzi and Shome (1994) give other suggestions including presumptive and minimum taxes, selective auditing, penalties, and crosschecks between taxes.

While there is need for better enforcement and administration, its utility should also be seen from the taxpayer's point of view. From an economic perspective, we also need that each additional rupee spent on enforcement should be rewarded with at least one rupee of tax revenue collected. Reinganum and Wilde (1988) develop a model in which taxpayers, tax practitioners, and the tax agency (facing an enforcement cost) interact to determine the extent of tax compliance. When practitioners control the reporting decision, they show a possibility that more income would be reported than if the taxpayers did not use the practitioner. Thus the tax

Box 5

VDIS 1997: Salient Features

- 4.66 lakh declarants
- Rs 10,050 crore revenue collection @30 per cent tax rate (states' share: Rs 7600 crore)
- Rs 33,000 crore declared income
- Almost all declarations in terms of past assets
  - 60 per cent as jewellery (gold, silver, and diamonds)
    Reference date for valuation—1 April 1987
  - 1/3rd in terms of real estate and shares
    No Reference date for evaluation
- 30 per cent: Nominal tax rate on declared income
- Approximate appreciation of assets during April 1987 to December 1997
  - 70 per cent—bullion
  - 280 per cent—diamond jewellery
  - 300 per cent—real estate
  - 600 per cent—shares

⇒ 250–360 per cent weighted average appreciation of declared assets

⇒ Rs 80,000–120,000 crore: actual worth of declared assets

- 8–12 per cent: Effective rate of tax on declared income

agency devotes less enforcement effort to practitioner filed returns than to taxpayer-filed returns.

Franzoni (1994) investigates the effect of increasing prosecution costs on tax enforcement policy when the tax agency chooses the audit rate to maximize its net revenue while taxpayers maximize expected utility. In this set-up, he finds that an unexpected amnesty increases the net revenue to the agency and determines optimal fee level. But an expected amnesty may involve a time consistency problem. In a dynamic setting, Das-Gupta and Mookherjee (1996) study a one-time tax amnesty as an asset-laundering device. They show that if the amnesty is anticipated (as seems to be the case in India) then this anticipation may lead to accumulation of black assets to be declared when the amnesty is announced. Another effect of such anticipation could be to 'misfile' income tax returns by diverting white income disclosures to the amnesty. The combined effect of these and other factors is that, immediately preceding the amnesty, compliance declines and black assets grow. But post-amnesty, aggregate net revenues collected by the government in the long run tend to be lowered. That is, an amnesty leads not only to revenue losses to the government, but it also generates a substantial amount of black income in the economy.

CONSEQUENCES OF BLACK ECONOMY

Tax evasion accounts for only a part of the black economy, which is of a much larger magnitude in most countries. Apart from tax evasion, black income is generated from illegal activities that are harmful to society such as smuggling, trafficking in illicit drugs, pornography, and gambling. But there are other apparently harmless illegal activities too such as 'moonlighting' (e.g. private tuition by salaried teachers and private practice by publicly employed doctors). While amnesty schemes provide an opportunity to convert black income into white in the case of tax evaded income, there are, in general, several other possible means of money laundering. A common way is by disguising profits from crime or illegal sources as legitimate investments, e.g. reporting a profitable options trade to explain the sudden appearance of a large amount in one's bank account. Based on a questionnaire, Acharya et al. (1985) found a number of popular Indian methods of converting black income and wealth into white as listed in Box 6.

Underground economy is a subject in which few admit to be involved, but most are curious to know about. Various alternatives used to describe this term are black, unobserved, shadow, informal, parallel, and hidden. There has even been the use of 'coloured markets' to describe legal, semi-legal, and illegal markets, especially in the Soviet Union. Prevalence of black income has been reported not only in developing economies but even in more advanced economies such as the USA, UK, Netherlands, Germany, Sweden, and Canada. In the USA, the advent of credit cards has *not* led to a 'cashless' economy. The per capita currency holdings used for payment of goods and services being concealed from the authorities have grown over time. In Italy, 'irregular' GNP exceeds by 30 per cent the officially reported figure. In Germany, about 27 per cent of GNP is not accounted for by the official statistical measurement system. The size of the 'hidden economy' in the UK is estimated between 2.5 and 15 per cent. In the most comprehensive study to date, Acharya et al. (1985) estimated India's black economy to be 18–21 per cent of GDP in 1980.

Why should the existence of black money worry us? One answer is that the greater the magnitude of the black economy the weaker would be GNP as a measure of welfare. Since tax data are used in the construction of national income data, evasion of taxes and corresponding underreporting of incomes could distort other data in national accounts. Thus the macroeconomic database of the economy can be subject to biases if the tax data is biased and use of the former in economic analyses can

Box 6

How to Make Black Income White?

- Show black income as income earned from agricultural activities.
- Arrange to receive a large number of monetary 'gifts' from 'friends' and relatives.
- Convert black money into foreign exchange through the black market in foreign exchange and have it remitted as 'gifts' from abroad.
- Buy lottery tickets from the real winners.
- Arrange to 'distribute' money to friends and relatives with little or no income, have them pay income tax on these incomes, and have them return the remaining in the form of white loans.
- Arrange for *hawala* loans (from a fictitious person or a friend or relative) (the most popular Indian method).
- Anyone with business or professional income—such as a shopkeeper—sells a 'fictitious bill' without delivery of goods and services. The buyer obtains a receipt for deductible expenses. The seller shows (fictitious) sales, brings the revenue on to its books, and 'whitens' the black income.
- Buy bearer bonds.
- Spend the black money on consumption (such as on a holiday or tourism).

Source: Acharya et al. (1985), based on a questionnaire.

lead to anomalies in economic policy. McGee and Feige (1989) aptly summarize the possible cause for such a situation that occurred in many of the western economies in 1970s and 1980s:

> A possible explanation of the widening gap between observed economic facts and received economic theory...(is that)...it is the economic facts that require scrutiny rather than the economic theories.... The growth of an unrecorded economy has distorted the official information system that is sending the current signals of economic malaise. As economic activity shifts from the recorded to the unrecorded sector, some basic economic indicators such as real growth rates, employment and productivity may become understated.... We may well be in a position to retain the assumption of behavioural rationality on which so much of our theory is based once we realised that rational individuals and policymakers will nevertheless produce irrational outcomes if the information basis for their decisions is systematically distorted.

Apart from the possibility of rendering monetary and fiscal policies ineffective, black income can lead to certain other negative consequences. Since black income is generated through illegal means it is mostly used in illegal activities and encourages corrupt practices such as bribery. The prevalence of black economy implies that some transactions such as those in the property market are made in black money. This leads to the generation of more black money. Even white money is sometimes converted to black. For example, more than 50 per cent of the value of property transacted in the real estate market in Bombay is made in black money. Since the transactions are in black they may not be very secure. Legal receipts for payments cannot be given and people have to depend on faith. Since black income has to be spent in an unaccounted fashion it leads to further tax evasion. For example, black income used to purchase expensive durable goods such as television and refrigerator might involve evasion of sales taxes. In addition to encouraging illegal activities, black money can have a destabilizing influence when used in speculative activities, which is what happened in the Indian property market. It is generally contended that black income leads to wasteful expenditures and encourages conspicuous consumption. But it is not clear if such a tendency necessarily has negative consequences for welfare. For example, under situations of Keynesian unemployment it could boost effective demand in the economy.

Black income is mostly invested in activities which tend to be less productive such as purchase of gold and property with the hope of making capital gains. A high percentage of residential flats in Bombay, for example, remain locked failing to provide any housing services (though part of the reason for this is the rent control and other laws that are unfavourable to landlords). It is also possible that black investment made from black money is more productive than white investment, leading to a relatively larger multiplier effect. Das-Gupta and Mookherjee (1996) make and justify this assumption based on low returns in the white sector due to government controls on bank deposit rates and the practice of administering interest rates. Even if returns from black investment go unrecorded in national accounts, they may trickle down to improve the overall level of living in the country. If such is the case, the black economy may be a good thing.

The fact that certain activities are concealed from the government implies that judging the amount of dirty money is largely guesswork. However, different researchers have found various ways of measuring the size of concealed income. Feige (1989) classifies these activities into two categories. The first comprises those that are *recorded* in the national accounts versus those that go *unrecorded*. The second consists of activities that are *reported* to the tax authorities versus those that remain *unreported*. Table 11.2 provides a summary of activities of each of these types.

TABLE 11.2

Break-up of National Income and Taxable Income

Recorded in national accounts	*Unrecorded in national accounts*
▪ Legal market income	▪ Income from illegal market and non-market activities: drugs, prostitution, pornographic materials
▪ *Imputed income:* home grown consumption, rent for owner-occupied housing	▪ Legal market income that escapes national accounts: deficiency in data sources
Reported	*Unreported*
▪ Income reported to tax authorities	▪ Income from legal and illegal activities not reported to tax authorities

Source: Adapted from Tables 1.1 and 1.2 of Feige (1989).

Unrecorded income is the amount by which national income is underestimated. Unreported income is the extent of underestimation of total taxable income. While there is likely to be an overlap between the unrecorded and unreported incomes due to illegal activities, the two would generally be different. However, due to unavailability of data, the most commonly used measure of black economy is tax-evaded income that consists of unreported income plus overstated tax deductions.

In the Indian context, concerns have been raised about underestimation of national income arising due to lack of information on the contribution of illegal activities. According to the recommendations of the 1993 System of National Accounts (SNA), the estimation of GDP must include income arising from such activities. However, given the lack of information on illegal activities, this task seems to be beyond the scope of the Central Statistical Organisation (CSO). Underestimation of output produced and overestimation of capital formation are both said to account for the observed high and rising levels of incremental capital–output ratios (ICORs) in the country. An explanation suggested for the growth in capital formation not converting into output growth is tax evasion.[4] While the rise in ICORs could be attributed to rising relative prices of capital, other reasons are also given for rising ICORs. These include unreported or unnoticed output which remains unrecorded and siphoning off of funds at construction stage showing high capital formation but leading to low output. Yet another reason could be underreporting of output due to non-inclusion of imputed rent on public administrative buildings; undervaluation of owner-occupied dwellings; underreporting of rental income from urban housing; constrained municipal valuation due to rent control laws, etc. But even if these errors could be accounted for, ICORs are still high.

SIZE OF UNDERGROUND ECONOMY

Various 'guesstimates' of unaccounted income in India range from Rs 350–700 thousand crore comprising more than 50 per cent of GDP.[5] Studies on the black economy of India include Acharya et al. (1985), Chugh and Uppal (1986), Gupta (1992), Pendse (1989), and Ray (1991). Most of these studies give interesting and useful discussion of the black economy, its causes and consequences, and sometimes 'guesstimates'. But Acharya et al. (1985) provide by far the most comprehensive and detailed analysis and estimates.

Various approaches to estimating black income can be categorized into *microeconomic approaches* and *macroeconomic approaches*. The former are based on micro data such as income tax returns and so give point estimates (i.e. relating to one year) of the size of unobserved activity. But they do not give temporal estimates of growth of this sector and suffer from certain limitations, e.g. by relying on data such as on income tax returns;

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[4] For an early study on this topic, see, for example, Ghosh et al. (1981).

[5] Compared to this, the declared amount of Rs 33 thousand crore under VDIS-97 formed less than 5 per cent of the actual parallel economy.

the estimates can be affected by sample selection biases like incentives to conceal information. The macro-approaches use data on national income and related variables that are collected for purposes unrelated to the study of the unobserved economy. Thus they are likely to yield more accurate estimates. Further, such data can be used to provide estimates of both size and growth of unobserved activities. But macro methods require explicit counterfactual assumptions to arrive at estimates. While some methods measure unrecorded income, others measure unreported income, and yet others unrecorded transactions. Thus, in general, the various methods are complementary to one another, yielding insights into different aspects of the issue. See Feige (1989) for more discussion on pros and cons of different methods.

The macro approaches can be further classified based on the two components of the unobserved sector: monetary and non-monetary. The monetary methods utilize money as a medium of exchange in production and distribution of goods and services and estimate what goes unrecorded, e.g. payment for domestic help. The non-monetary methods estimate activities of households and firms whose outputs are bartered and therefore mostly excluded from national income accounts, e.g. household chores carried out by a housewife.[6]

A popular method for measuring the monetary unobserved economy is based on *currency–ratio* approaches first put forth by Cagan (1958). In this method, currency is assumed to be the exclusive medium of exchange and the ratio of currency to demand deposits assumed to remain constant except for changes induced by the growth of unreported income. Unobserved income is obtained by fixing this latter ratio at a level observed often prior to World War II (under the assumption that, in the absence of an income tax then, incentives to conceal were absent). Tanzi, (1982) developed a variant of this method by relaxing the assumption of constant currency–deposit ratio. Acharya et al. (1985) employed a modified version of this *monetary* method. They found that a major source of demand for currency in India arises from transactions leading to direct and indirect tax evasion. Moreover, the growing unaccounted money adds to the tax burden.

However, Acharya et al.'s (1985) major recommendations were based on a *fiscal* (micro) approach first developed by Kaldor (1956). They used Indian data for 1975–6 and projected to 1980–1. The method was used to first arrive at an independent estimate of total taxable income using data from the national income accounts. The data on income tax returns was then used to estimate income assessed for tax. The difference between total taxable income and total income assessed for tax gives tax-evaded income. As mentioned earlier, Acharya et al. estimated India's tax-evaded income to be between 18 per cent and 21 per cent of GDP in 1980.

SUMMARY AND POLICY CONCLUSIONS

A taxpayer has an incentive to evade if it is financially worthwhile to do so given that it is costly for the tax authority to find out the true tax liability. Thus only under exceptional circumstances can one expect full tax compliance. By and large, one can expect compliance to improve if tax rates are reduced or penalties increased. Compliance can also be increased if taxes are enforced with an optimal penalty structure. An appropriate method of dealing with the problem is to have sensible tax policies to curb tax evasion and effective policing of illegal activities.

Apart from an emphasis on basic structural reforms, sensible tax policies include reduction of marginal income tax rates on individuals, firms, and corporations. Reduction of tax rates and hence incentives to evade could help widen the tax base. Thus the net effect of this policy need not necessarily be a reduction in revenue. Higher taxes on incomes, profits, and capital gains are also shown to have a negative influence on economic growth. Higher rates could, for example, discourage work effort and lead to inefficiency in the choice of labour and this could have a negative impact on the growth rate of the economy.

While amnesty schemes generally add to current revenue, they can also have implications in terms of future revenue generation, future tax base, and taxpayer behaviour in the presence of amnesties. Expectation of a future amnesty scheme leads to continued tax evasion. These schemes are perceived as being unfair to honest taxpayers that bear relatively greater tax burden. By allowing tax evaders to evaluate their assets at prices prevailing several years ago, such schemes help the beneficiaries effectively pay much lower taxes than applicable. Adverse compliance effects of amnesties or falling penalty collection can even outweigh direct gains from an amnesty. Elimination of amnesty, bearer bonds, VDIS, etc. will make the deterrence process more credible.

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[6] Estimation of the non-monetary unobserved economy suffers from the major problem of obtaining an appropriate valuation of production activities. The available studies, which focus on household production either estimate the opportunity cost of home production or evaluate the work done at the relevant market wages to obtain market cost. The estimates of non-market sector activities in the USA range from 37–51 per cent of the market economy.

Another policy to improve tax compliance is that of withholding of taxes through, for example, *tax deduction at source* (TDS). Reform of tax administration and effective enforcement (e.g. through bonus-based incentives for tax collectors), use of presumptive and minimum taxes, and selective auditing are some of the other methods of controlling tax evasion.

Tax evasion not only leads to revenue loss to the government, it also generates black income, which further erodes the tax base. Thus checking tax evasion is important not only to raise revenue and reduce fiscal deficit but also to curb black income generation, which undermines the role of fiscal policy and obscures the true measure of national income. Illegal activities other than evasion also provide avenues for black income generation. In particular, chasing black money is made difficult by money laundering activities. Since black income is generated through illegal means, it is mostly used in illegal activities and encourages corrupt practices such as bribery. The prevalence of a black economy implies some of the transactions such as those in the property market are made with black money. This leads to the generation of more black money. But while it is generally contended that black income leads to wasteful expenditures and encourages conspicuous consumption, it is not clear if such a tendency necessarily has negative consequences for welfare. For example, under situations of Keynesian unemployment it could boost effective demand in the economy.

If insights were obtained into the process of black income generation, an attempt could be made to curb the associated illegal activities. If, however, such activities cannot be curbed, at least an idea about the magnitude of the black economy would be useful to know the true level of national income in the economy. But empirical evidence suggests that estimating black money can be a very tedious task, often leading to inaccurate estimates. In the Indian case, Acharya et al. (1985) argued that tax-evaded income provides a significant proportion of actual black income and, if estimated correctly, can give a clue to the size of the black income generated in the system. If the growth of the black economy has been the same as the white economy so that black income still forms roughly 20 per cent of GDP, as estimated by Acharya et al. in 1985, tapping even 10 per cent of this income through better tax compliance will fetch the government 2 per cent of GDP. This can be used to reduce fiscal deficit from, say, 6 per cent to 4 per cent of GDP. It is likely that additional income generated from the investment of such income will remain unreported unless there is reason to convert black income into white. The upshot of this argument is that unreported income will keep multiplying over the years, thus eroding the tax base. Unless steps are taken to curb this tendency, raising revenue to control fiscal deficit will remain merely a hope.

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12

India's Export Competitiveness and Finance*

A. Ganesh-Kumar, Kunal Sen, and Rajendra R. Vaidya

INTRODUCTION

India has, in the past, witnessed episodes of balance-of-payments difficulties. Till 1991, the response of policy makers was to impose import restrictions that resulted in reduced economic growth. Following the reforms of 1991, India's exports, in US dollars, grew at an average of 19.6 per cent per annum over the period 1993–4 to 1995–6. Unfortunately, export growth has fallen to 5.6 per cent and 2.1 per cent in 1996–7 and 1997–8, respectively and is expected to be negative in the current year (–5.1 per cent, ES, 1998–9). These developments seem to suggest that we may be heading towards another balance-of-payments crisis, though perhaps not of the same magnitude as the one faced in 1991. This time the major source of concern is the decline in growth rate of exports. Why have India's exports not been competitive? Is the lack of competitiveness macroeconomic, specifically due to the real exchange rate? Or is it due to micro-level inefficiencies that have prevented industries from fully exploiting their potential cost advantages and/or rigidities that have hampered resource allocation to the more dynamic industries and firms? Whatever the reason, the most significant policy challenge facing the government currently is to sustain a high growth rate of GDP without getting into serious balance-of-payments difficulties. Towards this end a healthy growth of exports is vital because using import restrictions (like in the past) is a costly policy option and one that will not be available in the future.

International competitiveness generally refers to the ability of a country to expand its share in world markets. At a fundamental level, competitiveness of a country in a particular commodity depends on the price at which it delivers the commodity in a foreign market in comparison with the price offered by competing countries for that commodity in the same market. The evolution of overall competitiveness of a country over time is influenced by both macroeconomic and microeconomic factors. The most important macroeconomic variable influencing export competitiveness is the real exchange rate. A 'wrong' exchange rate impedes the country from competing successfully in international markets and can lead to balance-of-payments problems. Moreover, there is evidence to suggest that countries that have been more successful in achieving high export-led growth owe much of their success to having been able to maintain the real exchange rate at an 'appropriate' level. As the exchange rate directly influences the profitability of exporting firms across all sectors of the economy, it has often been used as a key policy instrument for export promotion.

At micro level, the factor generally considered the most important in influencing competitiveness in different industries/commodities is the evolution of total factor productivity in comparison with trading partners and competing countries. Maintaining a growth rate in productivity that can match, if not outperform, productivity growth in competing countries is essential in order to retain/increase our shares in world markets. Given the endowments (in terms of labour, capital, natural resources, etc.) of a country, it is in the nature of things that over time the relative (in comparison with competing countries) productivity growth in certain sectors/commodities would be more than in other sectors/commodities. Theoretically, this should manifest in different trade specialization patterns in various countries in line with their productivity differences. The observed specialization patterns, however, may not correspond to the theoretical ideal because of various domestic and international policy distortions, such as tariffs and quotas. While productivity growth is essential to maintain competitiveness, in recent times there has been increasing awareness of the importance of various other factors also: first, technological upgradation and quality of products—both in terms of currently exported commodities and also a widening of the export basket to include new technologically sophisticated products; second, capacity to deliver—in the required quantities and in the right time. Productivity growth, technological upgradation, and the capacity to deliver the required quantities (i.e. the scale of operation) are factors that affect ex-factory competitiveness. These are directly influenced by firms' investment decisions. The decision to invest would of course depend on firms' perception of the future returns that the investment would yield. However, how much is actually invested depends on the availability and cost of funds. The latter in turn depends on the efficiency of the financial sector in making funds available at the right cost to those sectors where the potential for growth is highest.

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While the firm may do its best to improve its competitiveness by way of investments, its competitiveness could still be adversely affected by certain infrastructural constraints that are beyond the firm's control. High costs of energy, transport, and telecommunication raise the delivered price of the final product. Competitiveness is thus influenced by a myriad of factors. To delve in detail on all these factors is beyond the scope of this chapter. In particular, we do not discuss in any detail issues relating to infrastructure as these are dealt with elsewhere in this report.

Where do India's exports stand with respect to some of the above mentioned factors? We address this question in what follows. We first take a brief overview of the important policy changes that have taken place in the next section. This is followed by an overview of India's trade flows and the role of exchange rate in influencing export performance. In the fourth section, we assess export competitiveness at a sectoral level. The financing patterns of exporting firms and domestic firms are compared in the fifth section to gauge the extent of finance constraints. The sixth section concludes.

IMPORTANT POLICY CHANGES

Trade Policy[1]

In the beginning of the 1970s, India had a highly restrictive trade regime. Nearly all imports were subject to discretionary import licensing or were 'canalized' by government monopoly trading organizations. The only exceptions were commodities listed under the Open General Licence (OGL) category. Capital goods were divided into a restricted category and the OGL category. While import licences were required for restricted capital goods, those in the OGL could be imported without a licence (but of course only after paying customs duty) subject to several other conditions. The most important of these were that the importing firm had to be the 'actual user' of the equipment could not sell the latter for five years without permission of the licensing authorities and that the resulting change in capacity must be compatible with the capacity approved by the industrial licensing authorities. Intermediate goods were also classified into the banned, restricted, and limited permissible categories plus an OGL category. OGL imports of intermediate goods were also governed by the 'actual user' condition. The import of consumer goods was, however, banned (except those goods which were considered 'essential' and could only be imported by the designated government canalizing agencies).

Like imports, exports were also subject to an elaborate licensing regime. There were goods whose exports were 'not allowed', goods whose exports were considered on a case-by-case basis, goods whose exports were allowed within an export quota announced and allocated each year, goods whose exports were canalized, and goods on the OGL list that could be exported subject to prescribed conditions. The aim of this licensing system was essentially three-fold: first, to ensure that an 'essential' commodity was not exported when domestic demand was greater than domestic supply; second, to guard against adverse price movements in those international markets in which India was a key player; and third, to restrict the exports of intermediates in favour of 'high-value-added' downstream products (Agrawal et al., 1995). Furthermore, there were a large number of export incentives for manufactured goods. Special import licences allowed exporters to import raw materials more easily. The Cash Compensatory Support Scheme (which was introduced in 1964) provided cash assistance to exporters in respect of certain items. This was intended to compensate exporters for indirect taxes (most importantly, sales tax) on inputs imported or domestically produced. The Duty Exemption Scheme (introduced in 1976) granted customs duty exemption to registered exporters for imports of specified raw materials against an advance licence for the manufacture of specified export products and imposed upon exporters an export obligation in return.

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[1] The discussion of India's trade and exchange rate policy draws heavily from The World Bank (1989), Pursell (1992), Joshi and Little (1994), and Agrawal et al. (1995).

Beginning with the export–import policy of 1977–8, there was slow but sustained relaxation of import controls. Several capital goods that could not be imported without an import licence were steadily shifted to the OGL category. The number of capital goods on the OGL list increased from 79 in 1976 to 1170 in April 1988. These changes were made with the intention of allowing domestic industries to modernize. Moreover, during the 1980s the import licensing of capital goods in the restricted list was administered with less stringency (Pursell, 1992). As a consequence, the import penetration ratio in the capital goods sector increased from 11 per cent in 1976–7 to 18 per cent in 1985–6 (Goldar and Renganathan, 1990). In the case of intermediate goods too, there was a steady shift of items from the restricted and limited permissible categories to the OGL category. However, in practice, a capital or an intermediate good was placed in the OGL list only if it was not being domestically produced. Thus import liberalization during this period may not have led to immediate direct competition to established producers of intermediate and capital goods in India (though in several instances, the goods that were allowed to be imported were imperfect substitutes of domestically produced goods). Furthermore, the average effective tariff rate for capital goods increased from 37 per cent in 1973–4 to 63 per cent in 1988–9. Thus the liberalization of the 1980s through expanding the OGL list merely freed the importer from the bureaucratic hassle of obtaining an import licence in advance. That itself was a big gain.

The pace of trade reforms—in particular, the shift from quantitative import controls to a protective system based on tariffs—initiated in the mid-1970s was considerably quickened by the new government (led by Rajiv Gandhi) that came into power in November 1985. Restrictions on the import of capital goods were further eased to encourage technological modernization. Also, beginning in the mid-1980s, there was renewed emphasis by the new administration on export promotion. The number and value of incentives offered to exporters were increased and their administration streamlined. The allotment of REP licences—tradable import entitlements awarded to exporters on a product-specific basis—became increasingly generous (Agrawal et al., 1995). Finally, the duty exemption scheme for imported inputs was extended to cover all imported inputs for both direct and indirect exporters.

In 1991, as a part of the structural adjustment programme, quotas on the imports of most machinery and equipment and manufactured intermediate goods were removed. REP licences were abolished and a large part of the import licensing system was replaced by tradable import entitlements (named 'eximscrips') linked to export earnings. Furthermore, the 'actual user' criterion for the imports of capital and intermediate goods was removed. There was also a significant cut in tariff rates, with the peak tariff rate reduced from 300 per cent to 150 per cent and peak duty on capital goods cut to 80 per cent. There was, however, little change in trade policy with respect to consumer goods which remained in the 'negative' (banned) list. With regard to exports, the Cash Compensatory Scheme was withdrawn from 1992 with little change in other aspects of export promotion. In the post-1991 period, the primary instrument used to boost exports was the exchange rate. We now briefly examine the exchange rate policy.

Exchange Rate Policy

With the emphasis on export promotion from the mid-1980s, there was steady devaluation of the Indian rupee. Effectively, India operated an 'active' crawling peg from 1986 onwards to effect a sharp real depreciation of the rupee in the period 1986–90. In July 1991, as a part of the stabilization package, the rupee was devalued against the dollar by 18 per cent. From 1991 to 1993, India moved gradually to full current account convertibility of the exchange rate; first, in March 1992, by replacing the tradable import entitlements (i.e. eximscrips) with a dual exchange rate system, under which exporters could sell 60 per cent of their export earnings to authorized foreign exchange dealers at a 'market-determined' rate (the remaining 40 per cent at the official exchange rate); and then, in March 1993, moving to a unified 'market-determined' exchange rate system (i.e. a managed float). However, strict controls over the capital account, especially capital outflows, remain. This substantially mutes the influence of movements in the capital account on the exchange rate. Further, even on the current account, the 'market-determined' exchange rate is not completely free of intervention by the Reserve Bank of India (RBI). In line with the reforms, the nature of RBI intervention has undergone a qualitative difference. Unlike in the past when the RBI used to 'announce' the official exchange rate, it now influences to a great extent the 'market-determined' exchange rate through direct market operations as seller or buyer of foreign exchange and also through other policy instruments such as the interest rate. Indeed, it may be argued that in the recent past the RBI has been protecting the rupee through a combination of market operations and interest rate changes.

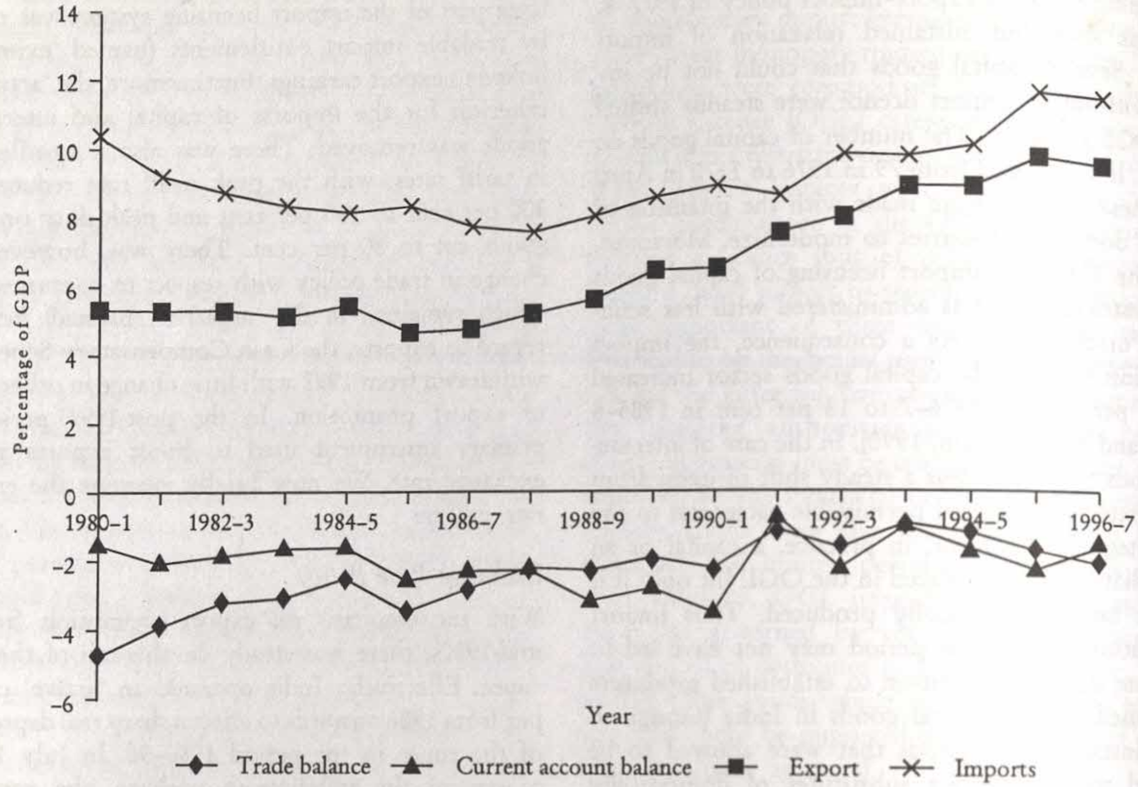

Figure 12.1 India's Trade Balance, Current Account Balance, Exports, and Imports

Financial Sector Policies[2]

From the point of view of financing decisions of firms the two most important are the deregulation of interest rates (both of commercial banks and term-lending institutions) and the freeing of pricing restrictions on new issue of shares through the stock markets. Interest rates on short-term loans (predominantly provided by commercial banks) have been deregulated in a phased manner since 1992 and by 1994 commercial banks were completely free to set their own lending rates. Interest rates on long-term loans (predominantly provided by all India development banks) were also deregulated in a phased manner and by 1992 were freed of all controls.

In 1992 there was substantial deregulation of the stock market especially with respect to the new issues market. Prior to 1992 there were strict guidelines on the pricing of new issues. These were done away with in 1992. In the post-1991 scenario financial decisions of firms are guided largely by market forces and no direct regulations (like price controls on issues of new shares and interest rate ceilings) exist that would push firms towards either debt or equity. Of course, other government policies like corporate taxes may lead to one being preferred over the other.

As a part of the financial sector reforms, there was significant easing of restrictions on foreign private capital inflows. Both foreign direct investment and foreign portfolio investment have increased substantially in the post 1991 period. These policy changes have had profound influence on how Indian firms, both in tradable and non-tradable sectors, finance their investments (both fixed and working capital).

OVERVIEW OF TRADE FLOWS

India has had a persistent deficit in the trade account during the period 1981–97 (Figure 12.1). However, trade deficit as a percentage of GDP as compared to the 1980s has been smaller in magnitude in the 1990s. This, in spite of a rapid increase in imports as a ratio of GDP, has been due to a strong performance by the export sector. It is important to note that this increase in exports has come primarily from the non-traditional sectors as is seen from the share of manufacturing in total exports, which has steadily been increasing since the mid-1980s (Figure 12.2). Following the efforts to liberalize trade, the economy has been increasingly open.[3] Nevertheless, the market share of India's total exports in world exports

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[2] For detailed coverage of various aspects of financial sector reform, see Sen and Vaidya (1997).

[3] Openness as conventionally defined is the sum of exports and imports as a ratio of GDP.

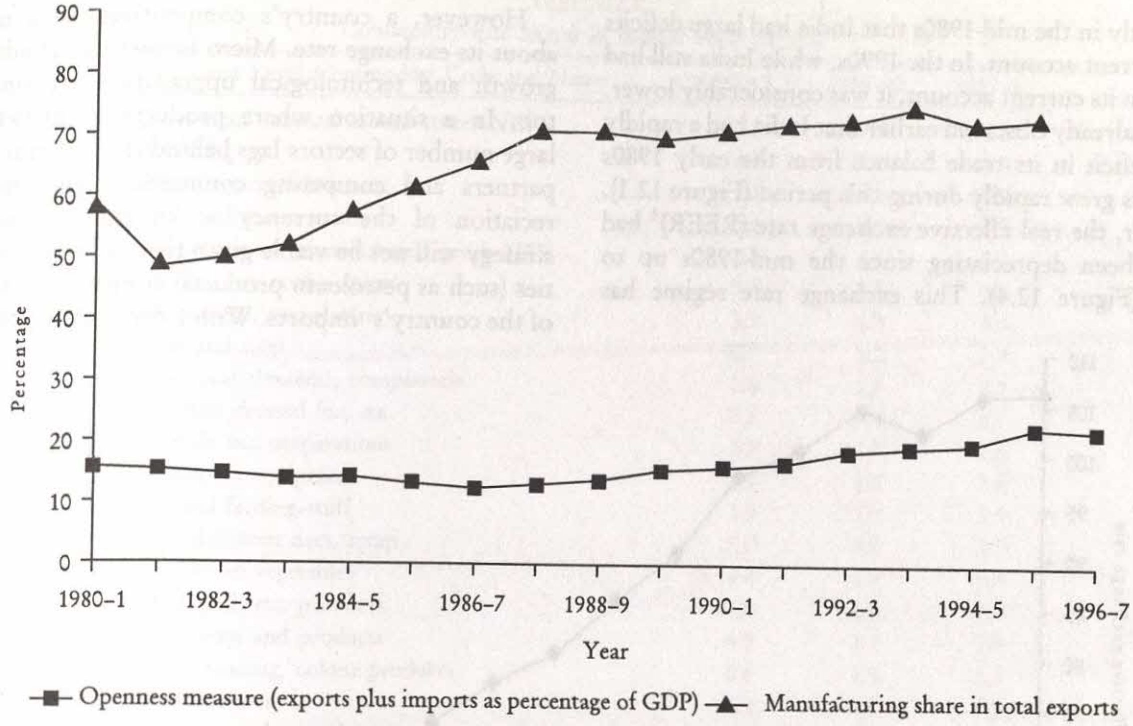

Figure 12.2 Openness and Composition of India's Exports

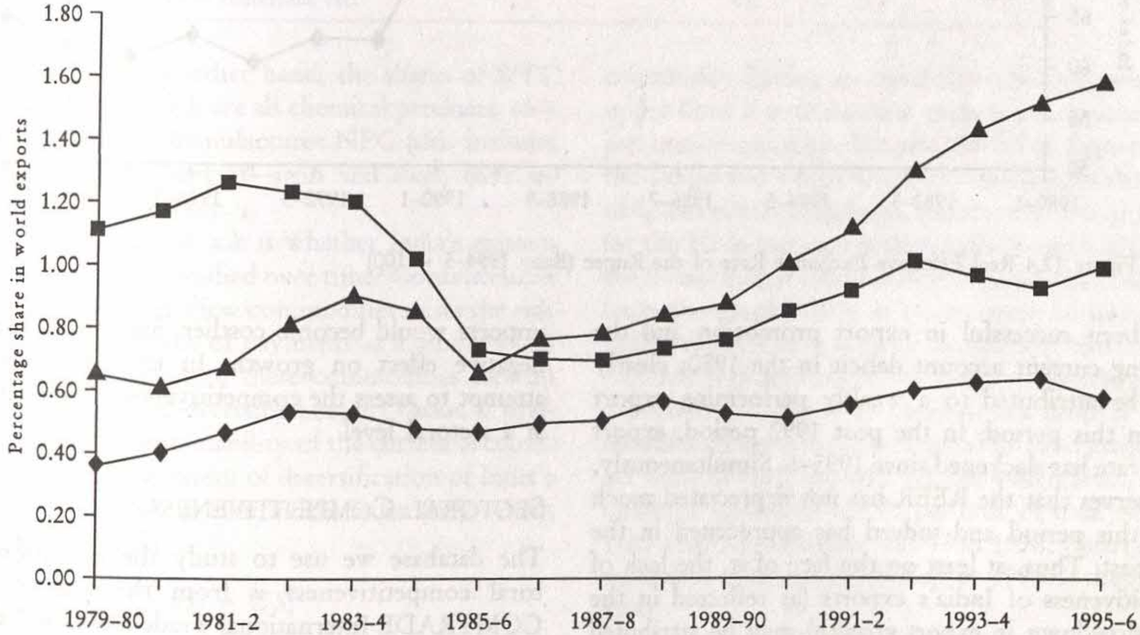

Figure 12.3 India's Relative Export Performance

has not improved substantially and continues to remain at less than 1 per cent (Figure 12.3). India's export performance as compared to the export performances of Malaysia and Indonesia, two fast growing South East Asian economies, has been rather modest. This seems to suggest that competitiveness of India's exports (when compared to some other Asian countries) is at best stagnant.

It is only in the mid-1980s that India had large deficits in the current account. In the 1990s, while India still had a deficit in its current account, it was considerably lower. We have already observed earlier that India had a rapidly falling deficit in its trade balance from the early 1980s as exports grew rapidly during this period (Figure 12.1). Moreover, the real effective exchange rate (REER)[4] had steadily been depreciating since the mid-1980s up to 1991–2 (Figure 12.4). This exchange rate regime has clearly been successful in export promotion and the worsening current account deficit in the 1980s clearly cannot be attributed to a weakly performing export sector in this period. In the post 1992 period, export growth rate has slackened since 1995–6. Simultaneously, one observes that the REER has not depreciated much during this period and indeed has appreciated in the recent past. Thus, at least on the face of it, the lack of competitiveness of India's exports (as reflected in the recent slowdown in export growth) may be attributed to exchange rate movements.

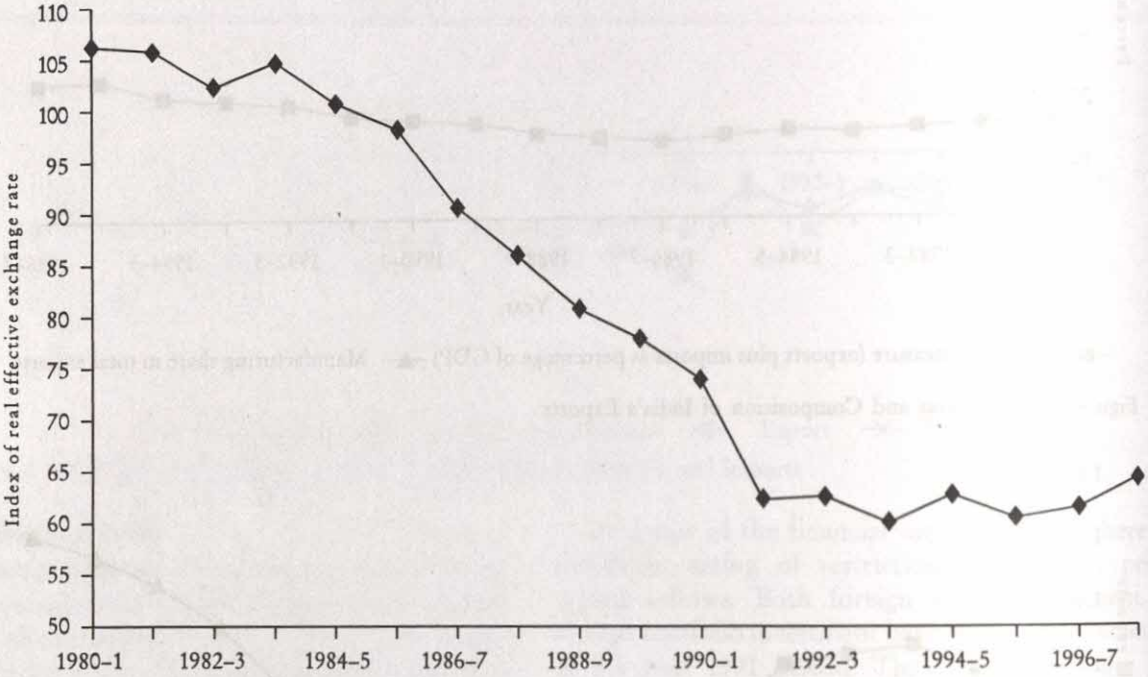

Figure 12.4 Real Effective Exchange Rate of the Rupee (Base: 1984–5 = 100)

However, a country's competitiveness is not just about its exchange rate. Micro factors like productivity growth and technological upgradation are important too. In a situation where productivity growth in a large number of sectors lags behind those of our trading partners and competing countries, a sustained depreciation of the currency as an export promotion strategy will not be viable given that essential commodities (such as petroleum products) constitute a large part of the country's imports. With a depreciating currency, imports would become costlier, and this could have a negative effect on growth. In the next section, we attempt to assess the competitiveness of Indian exports at a sectoral level.

SECTORAL COMPETITIVENESS

The database we use to study the evolution of sectoral competitiveness is from the United Nations COMTRADE International Trade Data. In Table 12.1, we present the percentage share (five year averages) of select commodities in India's total exports over the period 1980–96, at the 2-digit level of classification (the classification system used is the Standard International Trade Classification, SITC). It is evident from the table that the shares of SITC 07—coffee, tea, cocoa, and spices, 12—tobacco and manufactures, 26—textile fibres, 28—metalliferous scrap, and 61—leather, dressed fur, etc., have declined significantly in the period under

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[4] Real exchange rate (RER) is defined as an index of the relative price of domestic and foreign tradable goods and is usually measured as the nominal exchange rate times the ratio of domestic to foreign wholesale price index. Real effective exchange rate (REER) is a weighted average of the RER over various countries and is usually measured over (major) trading partners using bilateral exports as the weights.

TABLE 12.1
Commodity-wise Shares in India's Total Exports

SITC 2-Digit Level Commodity Code and Name	1980–5	1986–90	1991–6
66: Non-metal mineral manufactures NES	10.1	17.7	16.2
84: Clothing	8.3	13.1	15.3
65: Textile yarn, fabric, etc.	12.3	11.6	12.8
03: Fish and preparations	3.6	3.2	3.6
89: Miscellaneous manufactured goods NES	2.9	1.9	3.1
07: Coffee, tea, cocoa, spices	9.7	6.6	3.1
71: Machinery, non-electric	3.1	3.3	3.0
67: Iron and steel	0.7	1.2	2.9
51: Chemical elements, compounds	0.6	1.8	2.7
61: Leather, dressed fur, etc.	5.1	5.4	2.7
04: Cereals and preparations	2.7	1.9	2.6
73: Transport equipment	2.2	1.8	2.6
08: Animal feeding stuff	1.9	1.9	2.6
28: Metalliferrous ores, scrap	5.0	4.1	2.5
05: Fruits and vegetables	3.4	2.9	2.4
54: Medicinal, etc. products	1.5	2.0	2.1
33: Petroleum and products	8.9	3.1	1.9
53: Dyes, tanning, colour products	0.7	1.2	1.3
26: Textile fibres	1.4	1.4	0.6
12: Tobacco and manufactures	2.3	0.9	0.6
59: Chemicals NES	0.2	0.4	0.5
58: Plastic materials, etc.	0.0	0.2	0.5

consideration. On the other hand, the shares of SITC 51, 53, 54, 58, 59—which are all chemical products, 66—non-metallic mineral manufactures NEC (this includes gems and jewellery) and 68—iron and steel, have increased quite substantially.

The first question we ask is whether India's exports have become more diversified over time? Concentration of the export basket in a few commodities raises the risk to the country's balance of payments as a whole when the international prices of these commodities face an adverse shock.[5] A well-diversified export basket is preferable for long-run sustainability of the current account. In order to assess the extent of diversification of India's exports, we compute the Herfindahl index (HI), which is defined as follows:

$$HI = \sum_i S_i^2$$

where s_i is the share of each commodity in India's total exports. The HI provides a measure of the degree of concentration in India's export basket. If n is the number of commodities, then the lower limit of HI is $1/n^2$, and the upper limit is 1. At its lower limit, the index indicates that exports are completely diversified with each commodity having an equal share ($=1/n$), while at its upper limit it indicates that exports are concentrated in just one commodity. We plot the HI in Figure 12.5 for the 2-digit and 4-digit levels of classification that consist of 62 and 609 commodities, respectively. The lower limit for the HI in our case is thus 0.00026 and 0.0000027 for the 2- and 4-digit classifications, respectively. As is clear from the graph, there is no evidence to indicate that India's exports have become more diversified over time. Another way to look at the extent of diversification of exports over time, is to compare the number of commodities that account for a given of percentage (say 75 per cent) of total exports. At the 4-digit level, 40 commodities accounted for 75 per cent of total exports in 1980 while this number was 47 in 1996. Clearly, India's exports are only as diversified in 1996 as they were in 1980.

The export of a commodity by a country may increase due to a number of factors. It may increase because world exports have increased or because the country's exports have increased due to an undervalued exchange rate or because the country produces the commodity of same quality at lower cost than its competitors. The last is really the true measure of competitiveness. To capture this the notion of 'revealed comparative advantage' (RCA) is used. It is one of the

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[5] Recall the case of Nigeria after crude oil prices started falling.

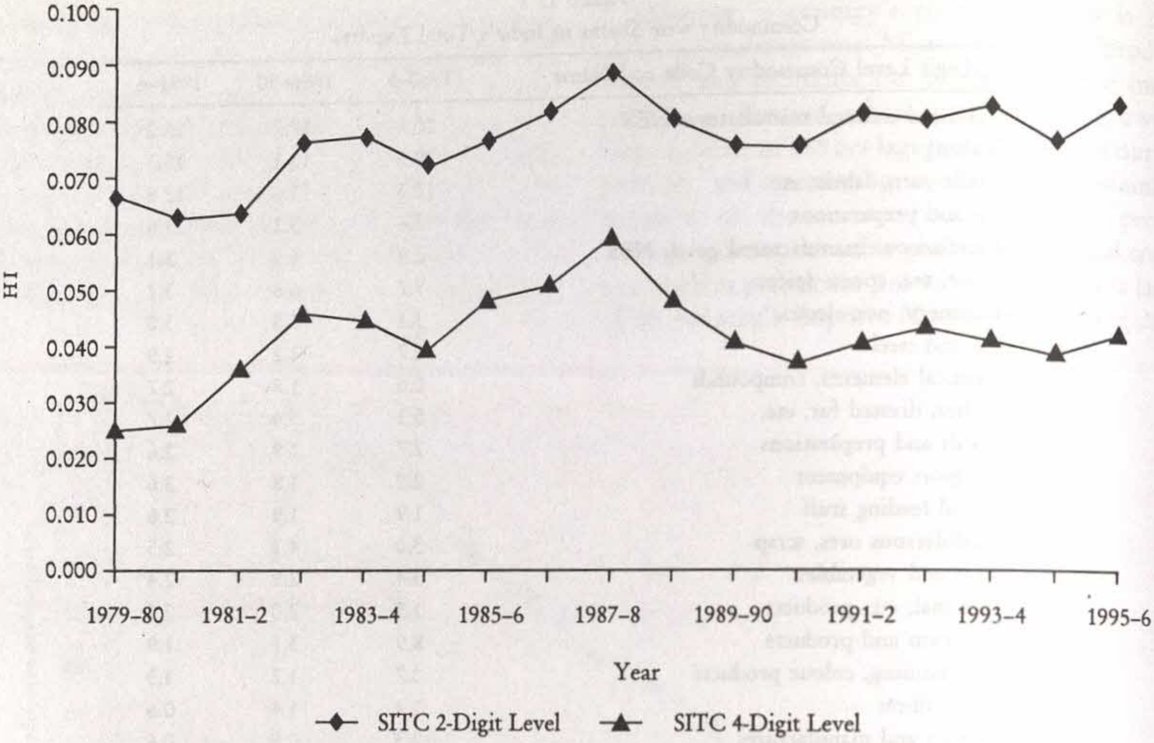

Figure 12.5 Herfindahl Index of India's Export Diversification

most commonly used measures of sectoral competitiveness. The RCA measure for a product *j* is defined as the share of a country's export of product *j* in total world exports of product *j* divided by the share of the country's total exports in world total exports. An RCA of unity would imply 'normal' export performance of product *j* relative to the size of the country as an exporter. An RCA of more than unity is usually taken as an indicator of competitive strength in that product and an increase in the RCA over time supposedly suggests a strengthening of the competitiveness so revealed (see Balassa, 1965, for further details). As a first step towards tracing the evolution of sectoral competitiveness RCAs are calculated at the SITC 4-digit level of classification only for those commodities that were exported in all the years over the period 1979–80 to 1995–6. Out of a total of 404 such commodities at the 4-digit level, only 159 had RCAs greater than one for more than half the sample period. In 245 commodities, India is clearly not competitive as suggested by RCAs that are less than one throughout the sample period.

Of the 159 commodities with RCAs greater than one, in as many as 83 RCAs have actually fallen over the sample period suggesting a weakening of competitive strength in these commodities. Only in 76 commodities, India seems to be gaining in competitive strength as in these cases RCAs are increasing over time. We proceed to examine whether these changes are statistically significant or not, by conducting a t-test for a significant change in the sample means of RCAs between the sub-periods 1979–80 to 1990-1 (Period I) and 1991–2 to 1995–6 (Period II).[6] Such a periodization broadly corresponds to pre- and post reform phases in India's trade and industrial policies. Commodities whose RCAs showed significant (at the 10 per cent level of significance) increase are classified as 'winners' and those that showed significant fall are classified as 'losers'.

In Table 12.2, we provide the list of winner and loser commodities. In all 46 commodities were winners (out of a total of 76 commodities whose RCAs rose) and 43 commodities were losers (out of a total of 83 commodities whose RCAs fell). Thus a fairly bleak

[6] The theme of the t-test is to split the whole time series of RCAs into two sub-periods (say I and II), compute the means of the series over the sub-periods and test for equality or inequality of these two sub-period means. At a given level of significance, a significant positive (negative) t-statistic would indicate significant increase (decrease) in the mean level of the RCAs in sub-period II compared to sub-period I. An insignificant t-statistic would indicate equality of the mean level of the RCAs between the two sub-periods; i.e., the RCAs are more or less constant over the full sample. For more details on these test procedures see Brockett and Levine (1984) and Kanji (1993).

TABLE 12.2
Winner and Loser Commodities
SITC 4-Digit Level Commodity Code and Names

Winner commodities	Loser commodities
0111: Bovine meat fresh, frozen	0313: Shell fish fresh, frozen
0311: Fish fresh, chilled, frozen	0488: Cereal, etc. preps NES
0515: Grapes fresh	0517: Nuts edible fresh or dry
0542: Leguminous vegetables dry	0519: Fresh fruit NES
0554: Flour, etc. of fruit, vegetables	0533: Fruit, jams, jellies, etc.
0813: Vegetable oil residues	0545: Other fresh vegetables
2218: Oilseeds, nuts, etc. NES	0741: Tea
2658: Vegetable text fibre, waste, NES	0751: Pepper and pimiento
2731: Building, dimension stone	0752: Spices excluding pepper, etc.
2752: Natural abrasives NES	0914: Margarine, edible fat NES
2839: Non-ferrous ore, concentrate NES	1210: Tobacco unmanufactured
4225: Castor oil	2625: Coarse hair uncombed
5129: Other organic chemicals	2633: Cotton waste uncombed
5310: Synthetic dye, natural indigo, lakes	2765: Quartz, mica, feldspar, etc.
5413: Antibiotics	2911: Bones, ivory, horns, etc.
5414: Vegetable alkaloids and derivatives	2919: Animal materials NES
5712: Fuses, primers, detonators	2924: Vegetable used in pharmacy, etc.
6291: Rubber tyres, tubes	2929: Other crude vegetable materials
6512: Yarn of wool, animal hair	4229: Fixed vegetable oil NES
6513: Grey cotton yarn in bulk	5333: Prepared paint, dryers, etc.
6516: Yarn of synthetic fibres	5530: Perfume, cosmetics, etc.
6517: Regenerated fibre yarn	5541: Soaps
6521: Grey woven cotton fabric	5542: Washing preparations, etc.
6535: Woven synthetic fabrics	6113: Calf leather
6556: Cordage and manufactures	6114: Leather bovine NES, equine
6576: Carpets, etc. unknotted	6119: Leather NES
6612: Cement	6123: Prepared parts of footwear
6613: Building stone, etc. worked	6294: Rubber belting
6712: Pig iron, including cast iron	6519: Textile fibre yarn NES
6731: Iron, steel wire rod	6522: Woven cotton bleached, etc.
6732: Iron, steel bars, etc.	6559: Special textile prods NES
6770: Iron, steel wire excluding w rod.	6561: Bags, sacks of textiles
6841: Aluminium, allys, unwrought	6562: Made-up canvas goods
6983: Iron, steel chain and parts	6574: Linoleum, etc.
7232: Electric insulating equipment	6671: Pearls unset, unstrung
7329: Motorcycles, etc. parts	7111: Steam boilers
8310: Travel goods, handbags	7123: Dairy-farm equipment
8413: Leather clothes, accessories	7291: Batteries, accumulators
8414: Clothing, accessories knit	8612: Spectacles and frames
8416: Rubber clothing including gloves	8630: Developed cinema film
8510: Footwear	8919: Musical instrument parts NES
8952: Pens, pencils, fountain pens	8944: Outdoor sports goods NES
8971: Real jewellery, gold, silver	8960: Works of art, etc.
8972: Imitation jewellery	
8991: Carved, moulded goods	
8999: Other manufactured goods NES	

Note: Winner (Loser) commodities are those that show significant increase (decrease) in the mean level of revealed comparative advantage (RCA) between the two sub-periods 1979–80 to 1990–1 and 1991–2 to 1995–6 (as shown by T-statistic that are significant at the 10 per cent level).

picture emerges at the micro level with India showing increasing competitive strength in only 46 commodities out of total of 404 commodities, while losing competitive strength in 43 commodities, and clearly not competitive at all in a vast majority of commodities.

TABLE 12.3
Distribution of Manufactured Exports by Technological Complexity

(per cent)

Category	1980	1995
Resource-based	26.5	31.4
Labour-intensive	55.4	45.3
Scale-intensive	11.2	13.5
Differentiated	4.1	4.7
Science-based	2.8	5.0

Source: Lall (1998).

Underlying this sectoral picture is the slow total factor productivity growth which has been documented by many authors (see, for example, Ahluwalia, 1991, Goldar and Renganathan, 1990). Though these studies are slightly dated, there is no compelling evidence to suggest that productivity growth has accelerated in the post 1991 period, especially in comparison with trade competitors. Clearly India has a lot of catching up to do.

Not just in terms of productivity growth, but in terms of technological upgradation too, the picture is rather discouraging. If our exports consist of commodities that are primarily 'resource based' or at the lower end of the technological complexity spectrum, then the country is likely to experience a slowdown in export earnings over time because the income elasticity of demand for such products would in general be low. A classification of India's exports by technological complexity indicates that India's exports are very much at the low end of the 'technology spectrum' (see Table 12.3).[7] Labour-intensive and resource-based products are the two dominant categories in India's export basket. There has been some increase in the total share of scale-intensive, differentiated, and science-based products in India's manufacturing exports from 18.1 per cent in 1980 to 23.2 per cent in 1995. However, it is far below that of China (38.4 per cent), Malaysia (79 per cent), and Thailand (53.6 per cent).[8] A closer look at the 'winner' commodities in Table 12.2 shows that these are either labour-intensive, resource-intensive or scale-intensive products.

The comparison with China is particularly revealing. As of 1995, 9.7 per cent and 16.3 per cent of China's exports were in science-based goods and differentiated products respectively as compared to 5.0 per cent and 4.1 per cent for India. Differentiated products are technology-intensive engineering products while science-based products use leading-edge technologies (Lall, 1998). Both these types of goods could be considered 'high technology'. While China and India are both large labour surplus economies with comparative advantage in labour-intensive manufactures, China is also diversifying into the low–medium technology end of export-oriented activity, with India doing poorly in this area. Clearly, the relatively slow progress in 'climbing up the technology ladder' with respect to exports may act as a constraint on India's long-term export performance and growth potential.

A word of caution is warranted here. The indicators of competitiveness used above are all *ex-post* measures based on actual realized exports. They are not completely indicative of the export potentials that may be possible currently and in the future. For example, many agricultural products, textiles, etc. have been subjected to a strict regime of quantitative restrictions (QR). Except for agricultural commodities, these QRs are being gradually dismantled. To that extent, competitiveness measures derived from past export figures for such commodities do not reflect 'true' competitiveness. Thus, potentially, there are more winner commodities than in our list. However, a dramatic change in the picture is not expected, even after the eventual dismantling of all QRs in the near future as per WTO agreements. Micro- level improvements are a must for long-run competitiveness of India's exports.

In order to accelerate productivity growth and also to diversify production and exports towards technologically advanced commodities, investment is the key variable. It is also critical to achieve scale economies in production and improve the capacity to deliver in the right time and in the right quantities. This is important if India is to emerge as a 'reliable' supplier in world markets.

As already mentioned, a firm's decision to invest would of course depend on its perception of the future returns that the investment would yield. In a world of complete and perfect capital markets, all the firm's desired investment would be realized. But reality is one of imperfect capital markets in which information asymmetries exist between suppliers and users of funds. How such imperfections are likely to affect investment decisions can be studied only at firm level by analysing their financing patterns. We attempt to do this in the next section.

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[7] We have used Lall's (1998) classification of the technological complexity of various exports, which is a refinement of OECD (1987).

[8] See Lall (1998) for further details.

FINANCING PATTERNS AND INVESTMENT: EXPORTING FIRMS VERSUS DOMESTIC FIRMS

An important question that arises is whether there are any relationships between export performance of firms and financial factors. Specifically, do successful exporters face less information-based capital market imperfections than the not-so-successful exporters? The modern theories of finance which attempt to explain differences in financing patterns across firms emphasize differences in costs associated with different providers of funds. They stress the lack of substitutability between internal sources (retained profits and depreciation) and external sources (different types of debt and new equity) of funds. This imperfect substitutability arises primarily due to asymmetric information between the suppliers and users of funds and incentive problems between managers and owners of the firm. It has generally been argued that these information asymmetries and incentive problems make external funds more costly than internal funds. In the new equity markets, this manifests as a 'lemons premia' (as pointed out by Myers and Majluf, 1984) and in credit markets as credit rationing or loan mispricing (as pointed out by Stiglitz and Weiss, 1981, and others). Further, this view contends that the cost differential between internal and external funds would vary across firms depending upon the extent of information asymmetry. This view also suggests that simple transaction costs might vary across firms. The implication of a higher cost of external funds is that internal funds would be more important than external funds in financing investments. Clearly to the extent that a firm is forced to depend on internal sources for investment, its growth is said to be finance constrained. If exporting firms are finance constrained then this would be a major impediment to sustaining their competitiveness in international markets.

We classify firms in certain selected manufacturing industries into two categories, namely 'domestic firms' and 'exporting firms'. For each of these categories, we study the 'sources and uses of fund statements' as well as a few other financial performance indicators to look for differences in their financing patterns and financial performance.

Firms are categorized as 'domestic firms' and 'exporting firms' based on the share of exports in their total sales. If the exports to sales ratio of a firm exceeds 5 per cent over more than half the number of years in the sample period, then the firm is considered an 'exporting firm'; a 'domestic firm' otherwise. The reasoning behind this categorization is that there exist a large number of firms even in the tradable sector (be they winner or loser industries) that primarily sell only in the domestic market. Issues such as export competitiveness are obviously of little relevance to these 'domestic firms'.

This analysis is done for firms belonging to four industries. Earlier, we have identified 'winner' and 'loser' industries based on whether their RCAs have been increasing or falling over time, respectively. Two winner industries from that classification, viz. industrial chemicals and gems and jewellery, and two loser industries, cotton textiles and electrical machinery, have been selected for this analysis.

The database used is PROWESS provided by the CMIE, Mumbai. Only those firms for which data are available for all the years of the sample period are considered for the analysis here. The period of analysis chosen is 1989–90 to 1996–7. A sample of 118 firms from these industries was chosen based on three criteria. First, data for all years needed to be available. Second, manufacturing sales had to constitute at least 75 per cent of total sales for a firm to be selected. We thus did not consider firms whose major source of revenue is trading. Lastly, we dropped those firms which had a negative net worth for more than two years in the sample period. This ensures that no sick firms are chosen. Of the 118 sample firms, 70 were domestic firms and 48 were exporters as per our criterion described earlier. The presence of such a large number of domestic firms can be explained primarily in terms of the extremely restrictive trade and industrial policy regime that prevailed prior to 1985.

We begin by looking at some financial performance indicators of these firms. The indicators of the financial performance of firms used here are assets, export–sales ratio, and profitability ratio (profit before interest, depreciation and taxes to sales). Movements over the relevant time period in these indicators are studied by pooling firms across industries within each category domestic/exporters. We present in Table 12.4 average values of these variables.

The following broad conclusions emerge:

1. The average size and rate of growth in assets are lower for domestic firms.

2. The export to sales ratio is higher for exporting than domestic firms. This is of course definitional.

3. Profitability ratios are higher for domestic than exporting firms.

4. We also found that the correlations between assets (i.e. firm size), profitability, and the export to sales ratio were all insignificant.[9]

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[9] We have not reported the correlations matrix for brevity.

TABLE 12.4
Firm Characteristics

Average over firms	Firm type	1990	1991	1992	1993	1994	1995	1996	1997
Assets	Domestic	54.74	66.39	78.67	99.83	134.25	174.31	213.90	259.24
	Exporters	67.14	80.92	105.11	133.67	180.86	245.18	309.53	343.09
Exports to sales ratio	Domestic	0.01	0.02	0.02	0.01	0.01	0.02	0.02	0.02
	Exporters	0.18	0.21	0.23	0.26	0.27	0.28	0.28	0.31
Profitability ratio	Domestic	0.17	0.13	0.17	0.18	0.17	0.17	0.18	0.15
	Exporters	0.15	0.15	0.17	0.16	0.15	0.16	0.16	0.15

Note: Year 1990 refers to 1989–90, and so on.

Source: Authors's calculations based on firm-level data from PROWESS, CMIE, Mumbai.

The above patterns must, however, be interpreted with caution as all these variables show substantial variation across firms within each group for each year. With the exception of profitability all the other variables have coefficients of variation greater than 1.0.

We now examine the sources and uses of funds to see if there are differences in the financing pattern of firms in these two categories. Table 12.5 reports the sources and uses of funds statements for the domestic firms and exporting firms.

1. There is a reduction in the importance of internal sources after 1991–2 for the exporters.[10] This, however, does not seem to be true for the domestic firms, for whom the share of internal sources has been more or less stable.

2. Across the two groups and over the entire period, external sources are the most important, accounting for more than 60 per cent of the funds raised.

3. Amongst external sources, there was a dramatic rise in the funds raised from capital markets[11] in the three years 1992–3, 1993–4, and 1994–5. This rise is again more pronounced for exporters than for domestic firms. In the years 1995–6 and 1996–7, the importance of this source has fallen sharply for all three categories. This could basically be due to the slump in the capital markets after 1995. Thus it seems that reform measures pertaining to the capital markets have had a significant impact on the financing patterns.

4. There seems no discernible trend in the behaviour of total borrowings over the period. Thus it is not clear what, if any, has been the impact of interest rate deregulation on the financing patterns.

5. With regard to the uses of funds, on average there do not seem to be any dramatic changes in the pattern over time.

6. Over time, exporters on average have been able to raise more funds from various sources than domestic firms (except for the last year).

7. On average, borrowings have been more important for domestic firms.

The most significant finding is that external funds raised through capital markets as a percentage of total external funds are higher for exporting firms. The relative success of exporters in raising funds through capital markets possibly suggests that these firms face a smaller difference between the costs of internal and external funds (arising due to informational asymmetries and agency costs) than do domestic firms. This suggests that finance constraints are likely to be more severe for domestic firms than for exporters. Viewed from the perspective of the suppliers of funds, the quality of investment projects is likely to be superior for exporters who have a proven record in international markets—given that international markets are perceived to be highly competitive. The flip side to this is that success (or mere continued presence) in domestic markets, which were largely protected in the pre-1991 regime, is not sufficient assurance that the firm will remain successful in the increasingly competitive environment that is evolving in domestic product markets since 1991. In the liberalized environment, capital markets try to allocate resources across industries and firms therein based on their perception of growth potential. Towards this end they use signals about a firm's performance in international markets as criteria to make a judgement about the inherent strengths and weaknesses of the firm. In such a situation, it is in the interest of all firms for their long-run growth to strive to enter into and grow in export markets.

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[10] The figures for 1996–7 for exporting firms seem to be influenced by some extreme values and thus need to be interpreted with caution.

[11] The items under capital markets include new issues of shares, share premium, debentures and bonds, and fixed deposits from the public.

TABLE 12.5

Sources and Uses of Funds

	Domestic firms								Exporting firms							
	1990	1991	1992	1993	1994	1995	1996	1997	1990	1991	1992	1993	1994	1995	1996	1997
Sources of funds																
Internal sources	36.6	33.8	35.5	24.4	26.8	36.2	43.1	33.8	47.8	37.2	32.5	26.7	22.4	21.4	25.0	28.8
Retained profits	18.3	16.7	17.3	10.7	22.9	23.3	30.4	17.3	22.2	18.8	17.1	13.4	11.9	13.1	15.3	3.4
Depreciation	18.3	17.2	18.2	13.7	3.9	13.0	12.7	16.5	25.5	18.4	15.4	13.4	10.5	8.3	9.7	25.4
External sources	63.4	66.2	64.5	75.6	73.2	63.8	56.9	66.2	52.2	62.8	67.6	73.3	77.6	78.6	75.0	71.2
Capital markets	25.0	28.6	15.8	40.8	37.2	30.9	6.5	12.7	14.2	9.6	14.1	37.6	49.5	42.9	10.9	28.9
Fresh capital (excl. Bonus issues)	7.4	4.2	1.4	5.1	5.9	3.3	2.8	1.3	2.3	1.0	1.7	4.8	5.6	6.8	2.4	2.1
Share premium	4.3	3.0	3.2	7.4	16.2	32.4	10.2	3.0	4.2	1.6	2.5	18.3	36.2	29.8	7.8	10.5
Debentures/bonds	10.4	22.0	12.7	28.7	14.5	–5.4	–6.1	7.5	6.6	5.2	11.4	14.2	5.6	4.2	0.9	16.6
Fixed deposits	2.9	–0.6	–1.6	–0.3	0.7	0.5	–0.3	0.9	1.1	1.8	–1.4	0.3	2.1	2.1	–0.2	–0.4
Borrowings	18.5	21.5	31.1	24.3	17.5	20.6	31.3	41.5	25.7	26.8	23.0	30.1	12.4	18.5	46.4	22.1
Bank borrowings	6.4	5.4	7.1	6.1	0.3	14.5	12.3	16.8	21.2	4.5	13.2	15.7	1.0	12.0	33.4	–6.0
Financial institutions	5.1	10.3	30.0	16.0	12.9	4.4	2.3	7.3	4.2	18.6	6.1	12.2	3.8	7.4	8.7	17.7
Loans from corporate bodies	1.1	0.8	–0.8	0.5	–0.1	3.4	–1.8	4.6	0.7	0.0	0.3	3.0	0.0	0.7	–0.2	2.3
Other borrowings	6.0	5.1	–5.2	1.7	4.4	–1.7	18.4	12.7	–0.3	3.8	3.4	–0.8	7.7	–1.6	4.5	8.2
Current liabilities & provisions	20.0	16.1	17.6	10.5	18.5	12.3	19.2	12.0	12.3	26.5	30.5	5.6	15.6	17.2	17.7	20.2
Sundry creditors	10.5	13.1	8.7	5.6	11.4	5.3	12.7	10.3	9.7	20.4	18.5	5.8	11.2	13.2	13.2	14.5
Uses of funds																
Gross fixed assets	49.3	60.4	65.7	64.4	55.8	44.5	63.0	50.4	35.4	42.5	34.1	42.8	36.3	38.6	48.4	78.8
Work in progress	11.6	27.6	2.3	40.1	25.8	–21.1	16.0	15.3	–1.3	7.4	2.7	5.9	2.6	8.9	4.0	10.8
Investments	18.4	6.6	–4.8	3.8	16.4	7.7	–2.0	–0.1	0.7	6.3	3.4	4.5	20.2	19.4	0.7	1.4
Current assets	32.3	33.0	39.1	31.8	27.8	47.8	39.0	49.7	63.9	51.2	62.5	52.7	43.5	42.0	50.9	19.8
Inventories	17.2	16.3	13.0	7.0	2.2	10.7	10.8	9.5	22.9	22.0	17.4	18.3	10.0	12.7	14.1	0.7
Debtors	17.9	12.0	6.9	13.4	10.8	20.1	25.6	19.1	27.2	22.7	16.3	24.1	16.4	14.2	21.6	4.1
Cash and bank balances	1.7	–1.2	5.7	3.2	2.0	4.3	–1.0	8.3	–4.1	0.0	12.4	–2.5	2.4	2.8	1.4	9.4
Total sources/uses of funds																
Total over all firms	598	972	1039	1679	2482	2913	3087	3555	594	823	1236	1523	2529	3373	3383	1955
Average	9	14	15	24	36	42	44	51	12	17	26	32	53	70	71	41
Standard deviation	31	40	29	82	122	85	94	137	20	24	37	67	109	127	110	81
Minimum	–94	–15	–1	–20	–6	–9	–7	–30	–17	–8	–2	–79	–7	–6	1	–86
Maximum	203	308	170	591	745	451	539	845	80	95	130	378	550	611	481	430
No. of companies in panel	70	70	70	70	70	70	70	70	48	48	48	48	48	48	48	48

Source: Firm-level data are from PROWESS, CMIE, Mumbai. The aggregates reported are based on authors' calculations.

Note: Individual items of sources and uses of funds are reported as percentages of the total while the rest are in Rs crore. Year 1990 refers to 1989–90, and so on.

CONCLUSION

India has in the past used exchange rate depreciation as an export promotion tool and this has had its share of success in boosting export growth in the 1980s and early 1990s. With reforms taking the country from an 'administered' exchange rate regime to a more 'market-determined' exchange rate regime, continuous depreciation has not taken place in the mid-1990s and in fact some amount of appreciation has occurred in real terms. This is possibly a reason for the recent slowdown in export growth. The real exchange rate appreciation in recent times is basically a short-run problem affecting India's export competitiveness.

From a long-run perspective, a country's export competitiveness has to be rooted in micro-level competitiveness, in terms of productivity growth and technological upgradation. One can examine the competitiveness of Indian industries by looking at their comparative advantage revealed by their export performance. If a commodity's export share in the total global exports for that commodity grows faster than the country's overall export share in total global exports, then one can say that the commodity is gaining competitiveness. The picture that one finds at the sectoral level is rather bleak with India just not being competitive in a large number of sectors and losing competitiveness in some. Only in about 46 commodities out of a total of 404 commodities (SITC, 4-digit level of classification), is India gaining competitiveness.

Productivity growth and technological upgradation require firms to undertake investment on a regular basis. In this context, the efficacy of the financial sector in allocating resources to efficient industries and firms therein comes into question. Here one finds an optimistic picture in which the financial sector reforms undertaken so far have had the desired effect of allocating resources to more efficient firms. Exporting firms with a proven record in fiercely competitive international markets are treated favourably by capital markets and they face lesser financial constraints than firms that operate mainly in domestic markets that have been largely protected. Thus the financial markets have offered an enabling environment for exporting firms to grow.

What can the government do to improve productivity, upgrade technology, and enhance the delivery capacity of the country? The government needs to ensure that firms do not thrive merely on protected domestic markets but are made to operate in a competitive environment that forces them to strive for productivity improvements. This calls for greater trade liberalization that exposes Indian firms to greater competition from foreign firms than is prevalent currently. Simultaneously, the government should also make it easier for Indian firms to operate and to expand. Many of the bureaucratic controls at the central, state, and local levels that still plague the economy should be done away with so that Indian firms are better able to concentrate their resources and efforts in building their competitive strengths. These should be complemented with an all round systemic improvement, especially in key infrastructure industries such as power, roads, railways, and ports, to improve the delivery capacity of the country as a whole. Many of these infrastructure industries continue to remain with the public sector and thus as things stand are the responsibility of the government.

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13

Exporting in a Globalized Economy

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INTRODUCTION

The economic reforms in India emphasize international competitiveness and higher export growth. Discussions of industrial competitiveness in India mostly focus on policies with respect to trade, exchange rate, and macroeconomic stability. A neglected aspect is the importance of international linkages of industrial firms and the organization of production in a system of networks. The advent of global markets and integrated international production has direct consequences for India's competitiveness. There is evidence that the superior export performance of East Asian firms is partly attributable to their strategic use of cross-national production networks that organize, *across national borders*, production, procurement, distribution, R&D, design, and support services in a given industry.

The primary objective of economic policy reforms has been to accelerate economic growth for which the efficiency of the manufacturing sectors through increased competitive pressure and access to imported inputs at international prices is considered critical. However, India's share of world export markets is very low, at 0.60 per cent in 1996, relative to many other Asian developing countries. Also the share of manufactured exports in total exports has remained stagnant at around 74 to 75 per cent in the 1990s. Given the emphasis on export-oriented development, it is especially important to understand the nature of the global production system that shapes, the integration of Third World countries like India into the international economy. Achieving a higher level of export growth is critical to Indian industry's programme of restructuring in the globalizing economy.

In this context, this chapter deals with the following issues. What does one mean by globalization? How important is global production sharing and what is its nature? What kind of export roles can Indian industry assume in the global economy? What are the capabilities needed to take advantage of opportunities in the global production linkages? How is India placed in terms of resources and capabilities? How do domestic economic policies and institutions shape the extent and form of production linkages?

Following this introduction the next section provides evidence to support the view that global production is increasing. The third section discusses the concept of global commodity chain and alternative modes of organizing international industries. The fourth section outlines alternative strategies for Indian exports. The next section contains a brief discussion of the importance of foreign direct investment in facilitating entry into global networks. The roles of special economic zones and human capital are also highlighted. The last section concludes.

GLOBALIZATION AND GROWTH IN GLOBAL PRODUCTION

The increasing interaction of domestic economies with the world economy is generally termed as 'globalization'. Globalization is reflected in the rising share of international trade in world output. The volume of world merchandise trade is estimated to have increased at an average annual rate of more than 6 per cent, during the period 1950–94, compared with an output growth of

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less than 4 per cent (WTO, 1995). This means each 10 per cent increase in world output has on average been associated with a 16 per cent increase in world trade. The more interesting development was the steady rise in the ratio of trade growth to output growth for manufactures, from an average of 1.3 in 1950–64 to 3.2 in 1984–94. This ratio is found to be 4.3 for the period 1990–6. It is clear that the pace of global integration has been mainly driven by the manufacturing sector.

The relatively new aspect that makes globalization different, from earlier stages in the international division of labour, is the ability of producers to *slice up the value chain*. That is, 'breaking up of the production process into many geographically separated steps (Krugman, 1995). A good is produced in a number of stages in a variety of locations, adding value at each stage. Producers locate the different stages such that it improves access to resources and capabilities, and facilitates penetration of newly expanding markets. In effect, globalization promotes specialization in terms of the development of market niches. This process of slicing up of the value chain provides *greater* room for developing countries to specialize in the labour-intensive stages of the manufacturing process of a commodity, which as a whole might be capital intensive. This increases opportunities for developing countries to participate in and gain from trade. For example, production of semiconductor chips (integrated circuits used in a wide range of electronic products) is a capital-intensive process. It involves three basic stages excluding final testing, namely design and generation of photo masks, wafer fabrication, assembly and packaging of the assembled devise. The assembly stage is a labour-intensive activity using unskilled labour in which developing countries have comparative advantage.

To understand and analyse the implications of this globalization of production for specific countries like India, it is useful to utilize the concept of commodity chains. This is essentially a network-centred view of the world economy.[1] The concept recognizes that in the global economy, economic activity is not only international in scope, it is also global in organization. It is sometimes referred to as 'internationalization' in the earlier phase when economic activities spread across national boundaries. Foreign direct investment (FDI) by multinational enterprises/companies (MNE/MNCs) in natural resource industries like oil, iron, bauxite and copper production, post World War II, and tariff jumping FDI in the manufacturing Sector of Third World countries in the 1950s and 1960s capture the phenomenon of internationalization. Under this MNCs typically manufactured within host nations to reach host country consumers (cigarettes, autos, sewing machines, etc). Their advantage was the ownership of intangible assets like production knowledge and experience. The low marginal costs of transferring production methods, which were already mastered, gave MNCs an advantage that offset the costs of operating over distance in relatively unfamiliar areas. Internationalization merely involved transplantation of scaled down versions of advanced (home country) productive organization to Third World (host) countries. This soon made no economic sense for a number of reasons. First, world trade and investment barriers fell rapidly in the 1980s and early 1990s, under successive rounds of GATT negotiations. Developed country average tariffs on industrial products will fall to 4 per cent under the Uruguay round. Second, there was dramatic decline in transportation and communications costs. Sea freight unit real costs declined by 70 per cent between 1980 and 1996. The per minute cost of international phone calls fell by 4 per cent per year in the developing countries in the 1990s. Third, the role of knowledge (technology) and other intangible assets (trademark or brand name) became crucial and of strategic importance in world production. Geography and national boundaries are no longer overriding constraints. A US toy manufacturer sets up a purchase contract with a firm in Hong Kong (China), which establishes a joint venture to manufacture labour-intensive toys elsewhere in China, using plastics shipped from Malaysia, and ships the final product to the United States. The new logic is to supply every national market by sourcing from whichever country in the world, which could ensure efficient supply. The system of global production networks replaced the concept of internationalization.

The importance of the phenomenon of global production can be seen from the following:

1. Cross-border production by affiliates of MNEs as a share of world manufacturing output rose from 12.7 per cent in 1982 to 17.6 per cent in 1992. The share of MNE affiliates in developing country GDP increased rapidly in the 1990s from 4.3 per cent in 1992 to 6.3 per cent in 1995.

2. Over the period 1986–9, outflows of FDI have risen more rapidly than world trade (WTO, 1995). The spread of global production capacity, indicated by the ratio of FDI to GDP, doubled for the set of low and middle income countries, between 1990 and 1994. At the same time inter-country variation in FDI–GDP ratio declined.

3. Intra-firm trade, that is trade within MNEs, between parents and affiliates or between different affiliates, is rising. The share of exports in sales of US

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[1] For an elaborate discussion of the concept see the references cited in Ramaswamy and Gereffi(1998).

majority owned foreign affiliates in developing countries doubled between 1982 and 1993.

4. Trade in parts and components in the machinery and component sector is the fastest growing segment of world trade. Newly industrializing economies and developing countries exported about $100 billion of these products in 1995 (Yeats, 1998).

5. About 80 per cent of Hong Kong's re-exports from China were the result of outward processing arrangements. Under this system Hong Kong firms placed orders with Chinese enterprises to assemble products, provided them with design and components, and exported the finished products.

GLOBAL COMMODITY CHAINS AND EXPORT NETWORKS

'Globalization' implies the functional integration of internationally dispersed activities. The GCC (global commodity chains) approach to globalization emphazises the globalized coordination system that integrates the organization of international production networks (Gereffi, 1995). In this descriptive framework commodity chains are conceived as networks of business units involved from the stage of raw material supply to production, exporting, and finally marketing and retailing. It includes both forward as well as backward linkages from the production stage in the commodity chain. The business units may be subsidiaries of transnational corporations (TNCs) or independent companies of varying sizes. The concept of commodity chains exploits the new and complex division of labour in the global economy. It highlights the fact that cross-border inter-firm relationships extend beyond ownership linkages through FDI. The organization of production for some commodities may be coordinated by buyers and intermediaries, who are not manufacturers apart from established producers. Two alternative modes of organizing international production networks can be distinguished, producer driven commodity chains (PDCCs) and buyer driven commodity chains (BDCCs).

The PDCCs are found in those industries in which large, usually transnational, corporations play the central role in coordinating production networks (including their backward and forward linkages). This is characteristic of capital- and technology-intensive industries such as automobiles, aircraft, computers, semiconductors, and heavy machinery. International subcontracting of components is common for the most labour-intensive production processes, as well as strategic alliances between international rivals. Capital and proprietary know-how constitute the chief barriers to entry into PDCCs. The commodity chain in this case is supposed to be driven by the TNC or the producer.The sources of profit are scale of production and technological innovations. Outsourced production is controlled by the TNC mainly through equity investment. (See Box 1 for networks in electronics and learning).

Box 1

Networks and Learning in the Asian Electronic Industry

The USA had a trade deficit of $ 25 billion with Asia in electronics in the 1990s. East Asia has a prominent role as a source for the supply of final assembly and manufactured components for the US electronics industry. Electronics is the largest internationally traded and most competitive export industry in East Asia. It is an example of a fast growing product within which the division of tasks across national boundaries is technologically possible and advantageous to TNCs. A major role in promoting East Asia as an export platform was played by US producers and mass merchandizers of household appliances, who purchased electronic products from OEM suppliers. Much can be learned from the East Asian experience in electronics industry. Largely in response to the competitive challenge posed by Japanese electronics firms in the 1980s, US electronics firms gradually deepened the technological capacity of their Asian affiliates and increased local sourcing of components, parts, and sub-assemblies. It has led to the development of a wide variety of support industries, which have grown alongside electronics. TNCs and foreign buyers were initially attracted to East Asia because of low labour costs. Foreign firms supplied training, advise on manufacturing processes, and product styling as well as capital goods. TNCs supplied training for assembly workers so that quality and delivery targets were met. After a period of learning the art of assembly, during the 1980s electronics took off, overtaking clothing and other sectors as the large export industry. Local firms learned under OEM and subcontracting arrangements. Learning by OEM was an instrument through which local firms gained entry, secured a market channel, and acquired technology. During the latter half of the 1980s each of the four countries, namely South Korea, Taiwan, Hong Kong, and Singapore, made the transition from simple assembly activities to complex industrial systems, semiconductors, disk drives, and peripherals. Buyers enabled firms to expand their capacities and obtain credit against guaranteed forward export orders, product design information as well as quality and cost accounting procedures. The largest buyers often visited factories frequently and supervised the start up and quality control operations. The explicit focus on export markets and the most demanding buyers enabled them to overcome the latecomer disadvantages (Hobday, 1997).

Source: Ernst and Guerrieri (1998) and Gereffi (1996).

Buyer driven commodity chains are found in those industries where large retailers, branded marketers, and trading companies play the key role in setting up decentralized production networks in a variety of exporting countries, typically located in the Third World. Locally owned Third World factories that make the finished goods (rather than components or parts) for foreign buyers generally carry out production. The branded companies or large retailers that design and order the goods supply the specifications. This pattern of trade-led industrialization has become common in labour-intensive consumer goods such as garments, footwear, toys, housewares, consumer electronics, and a variety of handcrafted items (e.g. furniture, ornaments). The BDCCs tend to be labour intensive at the manufacturing stage. Consequently, they are characterized by very competitive and decentralized factory systems. They are also design and marketing-intensive activities. The barriers to entry into BDCCs are investment in product development, advertising, and EDI (electronic data interchange) linkage, between stores and their suppliers for inventory control and automatic orders. Control of outsourced production is through non-equity arrangements with local firms, such as subcontracting. (See Box 2 for apparel chain).

In contrast to PDCCs, where control is exercised at the point of production, in BDCCs the main leverage is exercised by retailers and branded merchandizers at the marketing and retailing end of the chain. In fact, the essence of BDCCs is the separation of physical production activity from the design and marketing stages. The companies constituting the BDCCs are 'manufacturers without factories'. For example, retailers like Wal-Mart, Sears Roebuck, and J.C.Penny, athletic footwear companies like Nike and Reebok, and fashion-oriented companies like Liz Claiborne and The Limited, do not manufacture the products that they design or sell. They link overseas factories and traders with evolving product niches in the main consumer markets.

There has been substantial consolidation of power in the hands of retailers and designers in the developed countries. Between 1991 and 2000,for example, the ten biggest public retailers in the United States are expected to increase their share of the US retail market from 34 per cent to nearly 60 per cent (KSA, 1992). This is a consequence of mergers and acquisitions in the US retail sector. They are expanding their operations to Mexico. A similar shift in power from manufacturers to distributors and retailers appears to be under way in the European Union as well. For example, in Germany, the EU's largest national market, the top five clothing retailers have a market share of 28 per cent. In the United Kingdom the top two clothing retailers (Marks & Spencer and the Burton Group) control 25 per cent of the UK market. This will continue to provide the retailers and designers unprecedented scope to reshape international supply networks.

The East Asian newly industrializing economies (NIEs) became successful exporters in the late 1960s

TABLE 13.1

India's Export Share in Selected Globalized Products in 1994

Description	India's exports (US $ million)	World exports (US $ million)	Share of India in world exports (per cent)
1	2	3	4
	Buyer driven commodities		
Women's clothing, woven	1393	29,490	4.7
Men's wear, woven	829	29,463	2.8
Footwear	563	32,775	1.7
Toys	70	22,472	0.3
	Producer driven commodities		
Motor vehicles parts & accessories	251	102,839	0.2
Internal combustion engines	107	46,829	0.2
Valves & transistors	34	115,412	0.03
Computer equipment	83	93,669	0.1

Source: UN International Trade Statistics.

Box 2

Apparel Chain and India's Garment Exports

The Export performance of India's garment sector has been remarkable. Garment export in the year 1995–6 was $ 3676 million. It was just $ 1598 million in 1989–90. It has more than doubled in the last five years. Cotton predominates as the fabric base of India's garment exports. The success story of Tiruppur, a small town in Tamil Nadu, in knitwear exports is well known. It is said to have started when a buyer from Italy first gave a contract to a local factory. Soon other large buyers like C&A Mode (UK), Sears, J. C.Penny, Woolworth (USA) followed. Other important US buyers of India's garments include K-mart, specializing in low priced giant orders, and fashion oriented companies like Liz Claiborne. India's share in world exports of clothing in 1994 was 2.6 per cent up from 1.5 per cent in 1980. However, the value of garment exports was only $ 3753 million in 1996–7 and $ 3776 in 1997–8 with a growth rate of only 0.6 per cent. India's share in world exports has stagnated since 1994. Why?

First, world clothing exports increased faster than trade in manufactures between 1983 and 1993. It is also the second fastest growing product category, next only to office and telecom equipment, the prime mover of global integration (GATT, 1994). Particularly, the second half of the 1980s was a period of rapid growth in world exports of clothing. India's exports closely follow the world trend. In 1996, world trade in clothing grew by 4 percentage points, having grown at 9 and 12 per cent in 1994 and 1995. In particular, exports of clothing from Asia to North America and Western Europe registered negative and 2 per cent growth respectively. Clothing imports into Germany and Canada show negative growth. The United States and the EU together account for more than 70 per cent of the world's clothing imports.

Second, with the enactment of NAFTA (The North American Free Trade Area) in 1994, market shares in the US textile and apparel market have continued to shift in favour of Mexico, Canada, and some Caribbean countries. Under NAFTA, apparel and other textile articles assembled in Mexico from fabric both made and cut in the United States can enter duty free. Further a special tariff provision (9802) of the US provides duty exemption for *US-made* components returned to the US as parts of articles assembled abroad. Duty is assessed on the value added and not on the value of the US parts sent offshore for assembly. This has led to rapid growth of what is known as 'production sharing' arrangements. Under this arrangement parts made in the US (or cloth cut to shape in the US) are sent abroad to countries with low labour cost for assembly and imported back to the US. Three-fourths of US imports from Mexico were under the special tariff provision 9802 and free of duties and quotas. Consequently, Mexico emerged as the second largest supplier by value ($ 4.2 billion in 1996) after China with a share of 9.2 per cent of the value of total US imports of MFA products. This illustrates the *potential dramatic impact improved market access can have on developing country exports.* In this case the growth in US apparel imports from Mexico seems to have come at the expense of Asian countries. The big American retailers such as Wal-Mart and Sears have started to promote Mexican goods through their North American networks. Since 1990, Latin American clothing exports have risen at an annual rate of 18 per cent. In Europe a similar arrangement known as 'outward processing trade' exists. Exports from Central/Eastern Europe to Western Europe have risen at the annual rate of 23 per cent between 1990 and 1996.

Third, the competitive dynamics in the US retail sector has resulted in increasing the pressure on apparel manufacturer suppliers, to adopt information systems, order fulfilment practices and related services that allow them to fill retailers' orders rapidly, efficiently, and flexibly. Lean retailers penalize suppliers if shipments do not accurately reflect the retailer order. Buyers are expecting more services in terms of minimum performance standards. Delivery and service emerged as the main weaknesses of Indian exports in the perception of importers in the EU, Japan, and the US (Koshy, 1997). Access to imported inputs, shipping facilities, and proximity to fabric sources have become more important determinants of outsourcing by foreign firms than mere manufacturing capability.

Fourth, India is at present a niche player in the low value segment of cotton fabric based, seasonal and fashions garments. It reflects its comparative advantage in cotton cloth and in meeting small orders. However, it has no presence in standardized garments based on standardized cloth, whether cotton or synthetic.

Strategic planing is needed to capture the benefits of trade liberalization under the Uruguay round agreement on textile and clothing. Its future export growth potential depends on two factors: first, its ability to move up the value chain in currently prominent products in its product portfolio; second, diversification of its product portfolio to include basic and standardized garments, and synthetic garments. This requires new investment and access to imported inputs. Access to imported inputs, fabric, trims and accessories appear to be easier with their removal from the restricted list. The current fall in international prices of manmade fabric (MMF) should help the industry change its fibre base to blend of cotton with synthetics. The policy should remove two major impediments to investment, namely product reservation and foreign investment restrictions. This would facilitate the entry of large domestic and foreign firms into the garment industry. The reform would enable the garment industry to develop capability to face the challenge of competition in the global market.

Source: Ramaswamy and Gereffi (1998).

and 1970s, primarily by mastering the dynamics of BDCCs (Gereffi 1996). Apparel was a leading export sector for each of the four East Asian NIEs, namely Hong Kong, Singapore, South Korea, and Taiwan; similarly toys for all except Singapore; and footwear for South Korea and Taiwan. East Asian firms became full range 'package suppliers' for foreign buyers. Package suppliers use locally produced raw material in contrast to CMT (cut, make, and trim) suppliers, who get the material from the buyers. Today China is the foremost volume exporter of consumer goods such as apparel, footwear, toys, and bicycles. Foreign buyers were an important source of technology and market information in the East Asian countries. Many local firms initially sold their goods to large buying houses from Japan and the US (Hone, 1974). Japanese buyers (e.g. Mitusubishi, and Mitsui) located in the NIEs to purchase cheap goods as wages rose in Japan in the early 1960s. US retail companies (J. C. Penny, Macys, Bloomindales, etc.) followed suit.

How do countries in BDCCs deal with competition from low cost suppliers? One of the important adjustment mechanisms for maturing export industries in East Asia has been the process of 'triangle manufacturing'. The essence of 'triangle manufacturing' is that overseas buyers place their orders with NIE manufacturers, from whom they have sourced in the past (e.g. Korean or Taiwan apparel firms), who in turn shift some or all of the requested production to affiliated offshore factories in low wage countries (e.g. China, Indonesia, or Bangladesh). The triangle is completed when the finished goods are shipped directly to overseas buyers under the US quotas issued to the exporting nation. The key asset possessed by East Asian NICs is their close relationship with foreign clients, which is based on the trust developed through numerous successful transactions.[2] Another way to counter loss of competitiveness in mature products is to move from simple to more sophisticated items within an export niche. One important reason for the continued apparel export growth of Hong Kong, Taiwan, and South Korea, even in the face of rising labour costs, is that they have upgraded the quality of their apparel products and moved to higher-value-added segments. Further, they are in the process of making the transition from OEM (original equipment manufacturing) to OBM (original brand name manufacturing), whereby manufacturers make goods for export and sell under their own label. The strategy is to carry out forward integration into retailing. Most of the leading Hong Kong apparel manufacturers now have their own brand names and retail chains for the clothing they make. There are Hong Kong owned retail stores throughout East Asia, North America, and Europe. With the restoration of Hong Kong to mainland China in July 1997, a combination of Hong Kong's marketing expertise and China's production capacity is likely to give the People's Republic of China enormous clout in the world clothing markets.

POSSIBLE STRATEGIES FOR INDIAN EXPORTS

In this background, one could ask the following question. What kind of export roles can Indian industry assume in the global economy? The linkages with the global economy can be viewed through the following four export roles: (1) export processing assembly operations, (2) component supply subcontracting, (3) OEM, and (4) OBM. The mastery of each export role demands distinctive resources and capabilities. They represent systematic upgrading of the economy's industrial and technological capability.

Export-processing assembly operations are characterized by labour-intensive assembly of simple manufactured goods from imported components, often in special export processing zones (EPZs). These zones offer special incentives to foreign investment (e.g. 100 per cent ownership), better infrastructure, and flexible labour laws. Light manufacturing industries like garments, electronics, and footwear tend to get located in such EPZs. Both the East Asian and the Latin American Newly Industrializing Countries (LANICs) have been engaged in this kind of labour-intensive production. Countries like Mexico, which has the world's largest export-processing sector (*Maquiladora* factories) with 800,000 employees, have extended the benefits of EPZs to all export-oriented firms, without requiring them to be located in the special zones. China has set up SEZs (Special Economic Zones) within which economic activities—manufacturing, banking, exporting and importing, and foreign investment—take place in a more liberal environment. Duty exemptions for assembly type operations, combined with rapid processing of imported inputs and materials by custom authorities, made a significant contribution to China's export growth. During 1985–90, industrial output in SEZs of Guangdong and Fujian grew at annual rates of 16–17 per cent (Panagariya, 1998). Direct benefits of EPZs are foreign exchange earnings, employment, and income generation apart from spillovers of knowledge to local associated firms.

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[2] For an informative discussion of buyer–seller links in export development, see Egan and Mody (1992).

Component supply subcontracting refers to the manufacture and export of component parts in industries like automobiles, computers, and consumer electronics. Traditionally foreign subsidiaries in the host country manufacture parts for final products to be assembled in the country of destination. A more significant variant of this is found in South Korea and Taiwan, which have specialized in component production (e.g. PC-related products and semiconductor devices), for sale to diversified buyers in the world market. Since 1985, Taiwan has aimed at becoming a regional components centre. Taiwan lays emphasis on export assistance, R&D subsidy, and establishment of national standards for automotive components to support part producers among other measures (Abrenica, 1998).

OEM refers to the production of finished consumer goods (apparel, calculators, household appliances, TV, and personal computers) by contract manufacturers. The OEM is also known as specification contracting under which the supplying firm makes a product according to the design specified by the buyer, and the product is sold under the buyer's brand name. The OEM is a profitable but demanding export niche. The contract manufacturer must have the technological capability to make the product according to specification, monitor quality, and guarantee on-time delivery at the agreed price. The East Asian countries (South Korea, Taiwan, and Singapore) have excelled in OEM production. OEM can evolve into ODM (original design manufacturing) if the contract manufacturer acquires the own-design skills to produce the product. ODM represents an advance in technological capability (Hobday, 1997). OEM facilitated rapid industrial growth in electronics and the assimilation of technology by East Asian countries. In some cases, the restrictive marketing clauses of OEM were renegotiated so that South Korean firms can directly export the mature products to third countries (Hobday, 1997). Firms in East Asia, which pioneered OEM, are now attempting to progress towards original brand name manufacturing (OBM) in which firms produce for export and sale under their own labels. OBM is the final and the most difficult stage to attain for an export-oriented economy. Only South Korea (Hyundai cars, Samsung, and Lucky Goldstar in household appliances) and Taiwan (Acer computers and Giant bicycles) have achieved some success in this respect. India has greater opportunities to assume and develop the export role of assembly, component supplier, and OEM exporter.

HOW CAN INDIA ENTER INTO GLOBAL PRODUCTION LINKAGES?

Our analysis above suggests that one significant way of gaining entry into global markets has been through incorporation into international networks of trade and production. What would make India an attractive base for international outsourcing?

FDI, Infrastructure, and SEZs

The main avenue to enter international networks is through FDI. The share of the manufacturing sector in total FDI approvals for the period 1991–7 is found to be only 37 per cent. Cross-country studies of FDI indicate infrastructure quality, labour cost, and domestic market size as predominant factors that influence international investors relative to short-term incentives like corporate tax rebates (Wheeler and Mody, 1992). In a study of FDI in East Asia, building international networks is shown to be an important motivating factor behind FDI inflows (Rao, 1996). India has the advantage of a large domestic market but critical problem areas are in infrastructure and labour productivity. Labour costs are rising in many of the East Asian countries such as South Korea, Taiwan, Indonesia, and Singapore. Foreign investors from developed countries would be looking for cheap labour cost locations with macroeconomic stability. If India could improve infrastructure quality[3] and provide for a flexible economic environment, similar to that in SEZs in China, India would be able to attract a large amount of *re-locative* FDI from western as well as East Asian countries. A striking feature of 1997–8 FDI inflows was the sharp increase in inflows from South Korea, an emerging source of FDI, from US $6.3 million in 1996–7 to US $ 333.1 million in 1997–8 (RBI, 1998). An example of relocation is the collaboration between New Era Fabrics and Hanil Synthetic Fibre of South Korea, now called Hanil-Era Textiles Ltd. About 80,000 spindles from Hanil's plant in Korea have been relocated at Patalganga, Maharashtra. Hanil-Era is exporting the fabric back to Korea. Hanil, the South Korean group with a major presence in textiles, first shifted capacity by relocating in Indonesia in 1991.[4] The recent financial crises in East and South East Asia may adversely affect inflows from these countries but that should not discourage India from creating a favourable foreign investment climate.

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[3] Paul Krugman, Professor at MIT, is reported to have remarked during his recent visit to India that 'infrastructure development is not about high technology but about doing simple things right with the use of appropriate technology; the problem is not getting the right technology but getting the simple things in place'.

[4] *Business India*, 1994.

It is reported that outsourcing products from China takes about half the time that it takes to outsource from India largely due to high ship turnaround time and custom procedures. The problems of India's transport infrastructure are discussed in detail in *India Development Report 1997*. Unfortunately, the situation has not improved much since. Here I would like to highlightthe importance of industrial parks and other economic zones for India's exports. In East and South East Asia, sub-regional cooperation zones have been formed to attract external investment. A well-known one is the Johar (Malaysia)–Singapore–Riu (a free trade zone in Indonesia) triangle, in which cheap land and labour from Johar state and Riu province are combined with Singapore's technology and managerial expertise and communication infrastructure to attract investment. Sri Lanka has encouraged exporters to set up modern garment units as joint ventures with foreign companies by providing a package of incentives and by upgrading the shipping infrastructure. In Taiwan, the Hsinchu Science based park is the world's fourth largest maker of semiconductors. It has a conglomeration of 245 companies with total revenue of $14 billion and one central authority handling all utilities and services. Investment in this park is mainly from the private sector, which contributes 83 per cent, the share of foreign investors is 12 per cent, and the government contributes the remaining 5 per cent.[5]

The case for the promotion of SEZs in India can be supported for two reasons. First, certain policies difficult to apply on a wider scale, for example flexible labour laws, can be initiated with less resistance in these zones. A successful SEZ will serve as a model to be replicated in other areas and may help reduce resistance to change from pressure groups opposed to reforms. Second, improvement of infrastructure across regions of the country may be limited by availability of resources. By focusing on building up facilities on a smaller scale in chosen locations we may be able to ease the burden of financing infrastructure. What attracts investment is the availability of electricity, transport, and communication.

Human Capital is the Key

MNEs possess more advanced knowledge, which enables them to introduce new capital goods and organizational methods at lower cost. However, the absorption of new technology is limited by the stock of human capital

Box 3

Asian Crisis and the Response of Chinese Exporters

In 1997, Asia absorbed 59.6 per cent of China's exports. The Asian crisis has severely affected China's exports. Export growth was 5.5 per cent in the first eight months of 1998 compared to 20 per cent in 1997. China is reported to be responding to the crisis in innovative ways. Chinese companies are becoming more aggressive and more service oriented. Manufacturers are experimenting with new approaches such as going in for OEM, moving into new geographic markets, and greater investment in R&D. China sent forty-three teams to countries in Europe, Africa, and South and North America in search of markets. Companies are offering credit to South Asian buyers. The outcome is the doubling of export orders from new markets. These new markets would not only offset in part the negative impact of the crisis but would also likely be a boon once the world recovers from the crisis. The Shanghai Tyre & Rubber Company holds 60 per cent of China's export market and has its own brand of radial tyres. In response to the crisis it has taken to OEM and secured a contract to produce 1 million tyres for the Winstar brand in Brazil. The OEM strategy has been very effective in dealing with the crisis. There is a lesson here for the Indian corporate sector in terms of critical and *flexible* strategies needed to survive economic downturns.

Source: Far Eastern Economic Review, 24 September 1998, 52–3.

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[5] *Far Eastern Economic Review*, 6 August 1998.

in the host country. In a cross-country study of sixty-nine countries, Borensztein, Gregorio, and Lee (1998) find a positive association between the level of secondary schooling and FDI. Secondary school enrolment in India for males as a percentage of age group enrolled was 59,while it was 93 for South Korea in 1993. India is far behind in many other indicators of human capital.

The important fact to note is that FDI in the textiles and clothing industry of the South East Asian countries of Indonesia, Malaysia, and Thailand was primarily motivated by quota restrictions on home countries (Hong Kong, South Korea, and Taiwan) and lower labour costs in host countries. With the phasing out of quotas under the Uruguay round agreement, relative cost differentials assume greater importance. India has comparative advantage in skilled and relatively cheap labour. Our labour cost is sometimes offset by low productivity. Inter-country cost comparisons often look at only hourly wages. What matters is the cost of actual work content. One such study reported by KSA (Majumdar, 1996) finds that India's cost are higher than those of its competitors like China, Vietnam, Thailand, and Indonesia. This study estimates cost per standard minute of production of a standard garment. This includes wage cost, *productivity*, working days and working hours, absenteeism, management and service personnel, material and *transport costs*. This clearly suggests that quality infrastructure and productive labour are the basic necessities to participate in the global production network.

CONCLUSION

To export successfully in a global economy is to get integrated into it. Globalization is not a simple process of integration with world markets via arm's length market transactions. Countries are incorporated in the global economy through a network of international production, trade, and finance. The channels provided by the networks are especially important for India, which is trying to break into the world market for manufactured goods. An important element of the globalization process is the growth of intra-firm trade, which creates barriers to entry for developing countries. This increases the value of links with MNEs for obtaining access to world markets. The design of reform policies which facilitate India's participation in the global network of production needs greater attention. *The key to success in the international market place seems to be the attitude 'I will make what you need' and not 'I will sell what I make'.*

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14

The Governance of Indian Corporates

Jayati Sarkar and Subrata Sarkar

INTRODUCTION

Corporate governance deals with the ways in which suppliers of finance to corporations, i.e. debt holders and equity holders, exercise control and ensure accountability of company management so as to assure themselves the best possible return on their investment. The need for such monitoring arises due to agency problems that are likely to come up if the objectives of debt and equity holders, the financiers/owners of the company, are not implemented by the management which is acting as their agent. Good corporate governance is considered vital from medium- and long-term perspectives to enable firms to compete internationally in a sustained way and make them 'flourish and grow so as to provide employment, wealth and satisfaction, not only to improve standards of living materially but also to enhance social cohesion' (Charkham, 1994, 1).

Corporate governance in developing and emerging countries like India has attracted explicit attention only since the late 1980s with the dismantling of their existing protectionist and socialist regimes and opening up of their industrial sector to international competition and private ownership. In contrast, it has been an active subject of academic and policy debate for quite a long time in many of the advanced countries, particularly the US, UK, Germany, and Japan. The international competitiveness and successful functioning of corporates in many of these countries vis-à-vis those in most emerging and transition economies has slowly but surely alerted company owners and management in the latter to the fact that effective corporate governance is a crucial component for competitiveness and corporate success in the long run. In fact, the importance of the issue has been highlighted by international agencies like the OECD and the World Bank. In particular, the World Bank has been in the process of formulating a draft code on corporate governance for developing countries that would review the principles of effective governance, build on international guidelines, assess governance practices in emerging markets, and distil the best practices from these and developed countries.

In the case of India, while several channels of governance have formally been in place for a much longer time than in most of the developing economies, the issue of proper governance has drawn focused attention only recently. In fact, the lack of adequate governance of Indian corporates has been cited in the popular press, in academic debates, and in some committee reports[1] as one of the primary reasons for underperformance of companies and the growing disinterest of the small investor in corporate financing.

This chapter provides a review of the theoretical and empirical literature on corporate governance, as well as a comparative assessment of the governance mechanisms in India and in other developed economies, highlighting areas of convergence and divergence. The chapter also provides empirical evidence regarding one major issue in corporate governance, namely the extent to which different shareholders as well as debt holders in India have been effective in the governance of corporates. Effectiveness is measured in terms of the ability of financiers to positively influence company value. Specifically, the empirical analysis addresses the following questions: (i) How do equity holdings by different types of shareholders, i.e. directors and relatives, corporate bodies, foreign investors, financial institutions, and institutional investors like mutual funds and insurance companies, influence company value in India? (ii) Does the effectiveness of a particular type of shareholder in influencing company value depend on the extent of shareholding? (iii) Is the effectiveness of financial institutions in corporate governance reinforced by the fact that these institutions are also major suppliers of debt? (iv) Which is more effective in governance, equity or debt?

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[1] See, for example, CII (1998), RGICS (1998).

The chapter is organized as follows. The next section discusses in some depth the fundamentals of corporate governance, drawing on the extensive literature on this subject with respect to developed countries that have much more mature governance systems. This section puts in perspective the comparative state of governance in India and what could be the emerging issues in the country's transition to being a global player. The third section outlines the basic characteristics of the corporate sector in India. The fourth section discusses the principal institutions of corporate governance in India. Thereafter the empirical findings relating to the specific questions addressed in the chapter are presented. Lastly the sixth section concludes with the emerging issues in corporate governance.

THE FUNDAMENTALS OF CORPORATE GOVERNANCE

Over the years, two distinct prototypes of governance systems have emerged worldwide. One is the Anglo-Saxon 'market-based' model with widely dispersed shareholders, liquid capital markets, and a fairly vigorous market for corporate control, i.e. takeover market. The essential governing mechanism in this model is disciplining underperforming management through the 'exit' option—shareholders dissatisfied with company performance will offload their shares making the company susceptible to a takeover. This system is prevalent in the US, UK, and some countries of Continental Europe (see Table 14.1). The other system can be represented by the Japanese and German 'relationship-based' model characterized by less liquid markets, relatively inactive takeover market, and a greater concentration of shareholder power with banks, corporates and government. Under this system, the 'voice' option gains precedence over the exit option with dissatisfied stakeholders that include in large measure inter-corporate bodies, financial institutions, and family members, trying to forge long-term relationships with management and for whom 'collective achievement' and 'consensus' are the keys to long-term success. Under such a system, the development of a company's role in society is considered to go beyond just the maximization of shareholder wealth in the sense that the company does not go for 'unconstrained' profit maximization. Instead, it seeks to maximize profits while attempting to promote individual and collective interests of the other stakeholders of the company such as employees and customers who are directly affected by its conduct.

The fundamentals of governance of corporates by investors can be best understood within a principal-agent framework. Investors, who are either debtors or equity holders, can be considered as 'principals' who provide funds to set up a company and employ managers or 'agents' to run the companies on their behalf. The interests of the investors may not necessarily be aligned with those of managers, and the monitoring of managers cannot be costlessly undertaken by investors in the presence of asymmetric information (managers being better informed about company performance and prospects) and unobservable effort of the managers. Thus mechanisms of corporate governance essentially attempt to deal with providing managers with proper incentives, especially in non-competitive product and labour markets, to induce managers to work in the interests of the shareholders and make them accountable for company performance.

TABLE 14.1

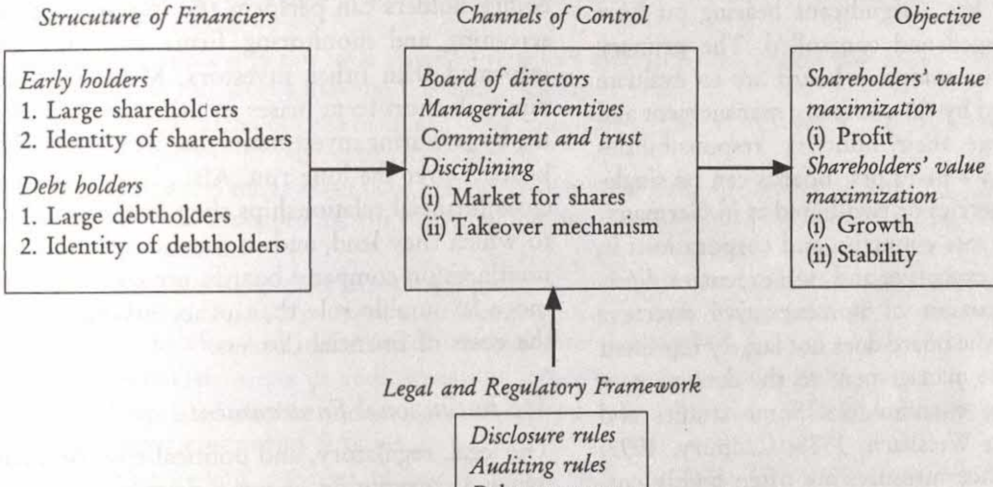
A Comparison of German, Japanese, and US Governance Systems

	Germany	Japan	US
Ownership	Concentrated: high family/corporate/ bank	Less concentrated: high bank/high corporate/ low management	Diffused: Non-corporate
Executive compensation	Moderate	Low	High
Board of Directors	Two-tier; management/ supervisory	One tier; primarily insiders	One-tier; primarily outsiders
Capital markets	Relatively illiquid	Somewhat liquid	Very liquid
Takeover market	Minor	Minor	Major
Banking system	Universal banking	Main bank system	

Source: Kaplan (1997, 252).

According to Mayer (1998), there are five channels through which corporate governance may bear on performance (Chart 14.1). These are through influencing managerial incentives, disciplining, financing and investment decisions, corporate restructuring, and instilling commitment and trust. These channels in turn are activated through several structural and institutional factors pertaining to a corporation, namely (i) the ownership structure of a corporation, (ii) the financial structure of the corporation, (iii) the structure and functioning of the company boards and the associated internal control systems, and (iv) the legal, political, and regulatory environment within which the corporate functions.

Chart 14.1



The Ownership Structure

The structure of ownership of a corporation determines in a large way how companies are managed and controlled. At the most simplified level of analysis, the ownership structure can be either dispersed among individual and institutional shareholders as in the US and UK or can be concentrated in the hands of a few large shareholders as in Germany and Japan. The former structure is characteristic of the image of a corporation portrayed by Berle and Means (1932) who hypothesized that dispersed shareholdings which characterize most companies may provide insufficient incentive for any individual investor to monitor and control the performance of a firm. This image has spawned an extensive theoretical and empirical literature on agency problems between the principal (i.e. the shareholders) and the agent (i.e. the managers), and ways to counter the problem through appropriate incentives and disciplining devices. Among these is the market for corporate control, which can play a potentially strong role in replacing underperforming management through hostile takeovers. Small, individual shareholders and institutional investors like mutual funds and insurance companies can exercise good governance via the market for corporate control by 'voting with their feet' in the sense that they can offload their shares if a company is underperforming and thereby expose the company to a takeover threat. The effectiveness of such a response in turn will be conditional on the existence of a liquid capital market and well-functioning market for corporate control (i.e. the takeover market).

While many corporations around the world are widely held, this is by no means the predominant form of ownership. Cross-country studies have shown that there is significant concentration of ownership both in developed countries (including the US and UK) and in developing countries. According to a study on corporate ownership of large corporations in twenty-seven wealthy economies (La Porta, Lopez-de-Silanes, and Shleifer, 1998), 36 per cent of the firms in the world are widely held, 30 per cent are family controlled, 18 per cent are state controlled, and the remaining 15 per cent are in miscellaneous categories. In countries like Argentina, Greece, Austria, Hong Kong, Portugal, or Israel, there are hardly any widely held firms in the study sample. Large shareholders are found to be quite active in corporate governance either through their representations on company boards or because they have greater incentives of monitoring given that they have much larger stakes in a corporation. Dominant shareholders are also found to be much better informed than the dispersed shareholders. Under the concentrated ownership structure, therefore, there is a lesser role for outside monitoring through the market for corporate control as has been the case in Japan and Germany, and greater reliance is placed on internal non-market monitoring mechanisms through forging closer personalized relations, commitment, and trust. However, while concentrated shareholding serves to solve to an extent the agency problems in a corporation, there are potential costs too in the form of straightforward expropriation of minority investors, inefficient expropriation through pursuit of personal, non-profit maximizing objectives, and the incentive effects of expropriation on the other stakeholders[2] (Shleifer and Vishny, 1997).

The Structure of Company Boards

Along with the structure of ownership, the structure of company boards has a significant bearing on how companies are managed and controlled. The primary responsibilities of any company board are to evaluate proposals put forward by the company management and to honestly discharge their fiduciary responsibilities towards the company's investors. Boards can be single-tiered as in most countries or two-tiered as in Germany. Boards also differ across countries and corporations in terms of the mix of executive and non-executive directors; a larger proportion of non-executive directors tends, to signify that the board does not largely represent the interests of inside management to the detriment of those of the outside shareholders. Some studies and reports (Fama, 1980; Weisbach, 1988; Cadbury, 1992) argue that performance measures are often highly correlated with the turnover of the chief executive officer for firms in which outside members dominate the board of directors. Research with respect to Japan and Germany where insider-dominated boards prevail shows that boards are quite passive except in extreme circumstances (Kaplan, 1994). However, overall, the available evidence on the relationship between the structure of a board and its effectiveness appears to be mixed.

The Financial Structure

Along with the notion that the structure of ownership matters in corporate governance is the notion that the financial structure of the firm, i.e. proportion between debt and equity, has implications for the quality of governance. Contrary to the Modigliani–Miller hypothesis that the financial structure of the firm has no relationship to the value of a firm, recent research has shown that the financial structure matters. Specifically, there has been a flood of research which shows that debt contract is an effective mechanism for solving agency problems, and that the defining feature of debt is the ability of creditors to exercise control on how a company is run. A failure on the part of the management to adhere to the terms and conditions of a debt contract triggers off the transfer of some control rights from the management to the lender. Herein come the significance of the effectiveness of lending institutions in monitoring management. Banks as creditors and in some cases also equity holders can perform the important function of screening and monitoring firms as banks are better informed than other investors. Moreover, banks can diminish short-term biases in managerial decision making by favouring investments that would generate higher benefits over the long run. Also, banks, because of the close financial relationships they foster with companies to which they lend, and in some cases because of their nominees on company boards, are considered to play a more favourable role than other investors in reducing the costs of financial distress.[3]

The Institutional Environment

The legal, regulatory, and political environment within which a corporation operates determines in large measure the quality of corporate governance. In fact, as several researchers have noted (Roe, 1994; Shleifer and Vishny, 1997a), corporate governance mechanisms are economic and legal institutions and often the outcome of political decisions. For example, the extent to which shareholders can control the management depends on their voting rights as defined in company law; the extent to which creditors will be able to exercise financial claims on a bankrupt company will depend on bankruptcy laws and procedures; and the extent to which the market for corporate control efficiently operates to discipline underperforming management will depend on takeover regulations. It is, however, often argued in the literature that one should not attach too much importance to systematically designing regulatory structures or worry about the appropriate governance reforms since in the long run product market competition would force firms to minimize costs and as part of this cost minimization, adopt corporate governance mechanisms that will be the most efficient. However, while product and factor market competition are the most powerful forces towards economic efficiency, these are slow to act as a control force and by the time their disciplining takes effect, large amounts of investor capital and other social resources may have been wasted (Jensen, 1997).

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[2] While the first three types of costs are self-explanatory, the incentive effects of expropriation need explanation. Expropriation by large investors can adversely affect the incentives of managers and employees who may reduce their firm-specific human capital investments when they are closely monitored by financiers and can be easily dismissed. Large investors may also crowd out the incentives of small investors in providing finance to companies and hence dry out alternative sources of external finance for companies.

[3] For instance, Hoshi, Kashyap, and Scharfstein (1990, 1991) using a sample of 121 Japanese firms find that financially distressed firms which have a few large financial institutions as their creditors, invest more and have stronger sales performance than non-group firms in the years following the onset of financial distress.

In the final analysis, a review of the existing literature on corporate governance systems in developed countries suggests that it is difficult to come out with a clear winner as to which one of the systems is best. As Charkham (1994) in his comparative study of alternative systems has noted, 'There are many paths to the top of the mountain' and 'we are too close to events to form a substantive judgement' (p. 364). Notwithstanding the fact that country-specific historical, political, social, and cultural factors have played a crucial role in the evolution of governance systems in all countries, certain basic principles of governance, as underlined above, appear to be universal (see Box 1 for the salient features of the US governance system).

Box 1

Keeping Good Company: Some Key Features of US Governance Practices

- There is no Federal Companies Act; companies incorporate under the laws of the state of their choice.
- A company is run by a board of directors elected by the shareholders and responsible to them for seeing that the company is properly run.
- The positions of chairman and Chief Executive Officer (CEO) have long been combined in more than 75 per cent of companies.
- CEOs and other executives get incentive compensation in one or more forms: (i) annual bonus based on profits, (ii) restricted stocks, (iii) long-term bonuses, and (iv) employee stock options.
- Non-executive directors form a majority on 94 per cent of manufacturing and financial firm boards and 93 per cent of the remainder. More than 60 per cent of all companies have no more than two members of management on their board.
- Financial results of companies are disclosed on a quarterly basis.
- Boards of smaller and younger companies meet about 6 to 7 times a year and boards of larger companies 9 times.
- Ninety-eight per cent of boards have audit committees consisting mostly of non-executive directors, 80 per cent compensation committees, and 50 per cent have nominating committees.

THE INDIAN CORPORATE SECTOR

The corporate sector in India has historically played a significant role in fuelling the country's economic growth. The corporate sector is large by developing country standards and the contribution of the industrial and manufacturing sectors value added to GDP is close to that in several developed countries. As of 1995, value added by the industrial sector stood at 29 per cent of GDP and that by the manufacturing sector at 19 per cent. Comparable figures for the US are 26 per cent and 18 per cent and those for the UK are 32 per cent and 21 per cent respectively.[4]

As in the case of many developing countries, the Indian corporate sector is characterized by the coexistence of public, private domestic, and multinational enterprises. Among domestic private enterprises are the large business houses and stand-alone companies. The number of listed companies in India has grown significantly since the initiation of capital market reforms in 1991 as a part of the overall structural adjustment programme. As of 1996, there were 8800 companies listed in the two major stock exchanges in the country, namely the Bombay Stock Exchange (BSE) and the National Stock Exchange (NSE).

Our analysis of corporate governance is based on a sample of 1613 listed manufacturing companies for which equity ownership data are available as of 1995–6. The source of data is the CIMM (Corporate Information on Magnetic Medium) database published by the CMIE. Public sector companies are not included in the analysis as their performance is influenced by a large number of social objectives that may be too diverse and complex to account for.

Table 14.2 gives the equity ownership pattern of these 1613 corporates according to broad ownership

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[4] *World Development Report*, 1997.

TABLE 14.2
Pattern of Equity Ownership in Different Types of Companies

Type of company	Mean equity holding by (%)					
	Directors and relatives	Corporate bodies	Foreign	Financial institutions	Institutional investors	Public
Private companies belonging to business houses	8.1	33.8	9.2	4.2	10.2	34.5
Private stand-alone companies	21.6	18.5	7.2	3.1	3.1	46.5
Foreign companies belonging to business houses	0.8	18.3	42.0	4.3	12.2	22.4
Foreign stand-alone companies	2.8	13.8	43.3	1.7	8.4	30.0
All	15.7	23.8	9.9	3.5	6.1	41.0

groups, i.e. domestic private companies belonging to business houses, domestic private stand-alone companies, foreign companies belonging to business houses, and foreign stand-alone companies. It is evident from this Table that the principal blockholders of corporate equity are (i) the term-lending institutions in India primarily comprising the three government controlled/promoted development financial institutions (DFIs)[5] and the state finance corporations, (ii) institutional investors, namely the government- owned mutual fund, the Unit Trust of India, and three government-owned insurance companies, (iii) corporate bodies, (iv) directors and their relatives, i.e. a measure of family holdings, and (v) foreign investors. Apart from these blockholdings, there is sizable equity holding by small investors.

Table 14.2 readily reveals certain broad differences in equity structure across the groups. Companies belonging to private business houses have significantly higher equity participation by financial institutions and institutional investors than stand-alones. This difference is particularly pronounced with respect to institutional investors. Second, domestic companies have a much higher holding by directors and relatives compared to foreign companies. Within domestic companies, the share of directors and relatives in stand-alone companies (22 per cent) is almost three times the share in companies belonging to business houses (8 per cent). However, companies belonging to the latter group have a significantly higher holding by corporate bodies (34 per cent) compared to stand-alone companies (19 per cent). If we look at the sum of holdings by directors and relatives and by corporate bodies, then this share is remarkably similar in domestic stand-alone companies and group companies. Since for group companies, a significant proportion of the holdings by corporate bodies may be holdings by other group companies, the extent of total insider control in these companies may be very similar to that in domestic stand-alone companies. The relatively low holdings by directors and relatives but higher corporate holdings as compared to the overall average probably reflects the fact that most business houses had developed as complex webs of companies and cross-shareholdings to take advantage of various government incentives to encourage industrial growth. This has left them with small, yet controlling, stakes in group companies. As expected, foreign companies, both stand-alones and group companies, have more than 40 per cent of their equity owned by foreign bodies. In domestic companies, the share of foreign bodies is less than 10 per cent, being slightly higher in group companies (9 per cent) compared to that in stand-alones (7 per cent). Finally, ownership of equity of stand-alones, both Indian and foreign, is much more diffused than that of business houses.

The above analysis of the equity holding pattern of Indian corporates reveals that the nature of equity holding as well as identity of the largest equity holder vary significantly across the different groups. While for domestic group companies, corporate bodies emerge as the single most dominant group followed by holdings by institutional investors, for domestic stand-alone companies, directors and relatives appear to be the most dominant group, followed by holdings by corporate bodies. For foreign companies, foreign bodies obviously emerge as the single most dominant group followed by holdings by corporate bodies.

While cross-country comparisons are somewhat difficult, given that the reporting of equity ownership data is not uniform, some broad comparisons with other countries suggest that the Indian corporate governance system can by and large be characterized as a *hybrid* of the 'outsider' systems of the US and UK characterized by diversified equity ownership and less involvement of lending institutions, and the 'insider' systems of continental Europe and Japan characterized by greater concentration of shareholder power residing with banks, families, and other corporates (Table 14.3).

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[5] The three major DFIs are the Industrial Development Bank of India with 75 per cent government ownership, the Industrial Credit and Investment Corporation of India promoted by government owned mutual fund and insurance companies, and the Industrial Finance Corporation of India with 100 per cent government ownership.

TABLE 14.3
Distribution of Outstanding Corporate Equity for Select Countries

Percentage of equity held by	India[a] (1996)	China (1995)	US (1993)	UK (1993)	Germany (1993)	Japan (1993)	Czech Rep. (1995)
All corporations	36.3	28.7	46	64	68	69	45.5
Financial institutions	12.7	—	46	62	29	45	—
Banks/lending institutions	6.6[b]	—	—	1	14	22	15.5[e]
Insurance companies	4.0	—	5	17	7	17	—
Pension/investment funds	—	—	26	34	—	1	—
Mutual funds	2.1	—	11	7	8	3	—
Others	—	—	4	3	—	1	30[f]
Non-financial corporations	23.6	—	—	2	39	24	—
Individuals	40.8[c]	31.5	49	18	17	24	49[g]
Foreign	9.8	6.1	5	16	12	7	3.4
Government	—	30.9	—	1	4	1	3.2
Others	15.3[d]	—	—	2	—	—	—
Total	100.0	100.0	100.0	100.0	100.0	100.0	100.0

Notes: The columns for India, China, and the Czech Republic are not directly comparable to the other four countries.

[a] Data are based on the study sample of 1613 companies.

[b] Includes commercial banks, government- owned/promoted term-lending institutions and financial corporations.

[c] Individuals include top 50 as given in Table 14.2.

[d] Others include shares held by directors and relatives as given in Table 14.2.

[e] Bank-sponsored investment funds.

[f] Non-bank sponsored investment funds.

[g] Include both individuals and local strategic investors.

Sources: Data for the US, UK, Germany and Japan from OECD (1995). Data for China from Xu and Wang (1997). Data for the Czech Republic from Claessens et al. (1996).

Table 14.3 shows that equity holding by non-financial corporations in India, which are primarily inter-corporate cross-holdings, are much higher than in the UK and US and are more comparable to Germany and Japan. At the same time, the participation of the small investor in corporate equity in India is at levels comparable with the US. While different types of financial institutions in India separately hold much smaller blocks than those in other countries, given that nearly all of these institutions are government controlled and fall under the aegis of the Ministry of Finance, these together form a much more homogeneous block than that in other countries. The participation of institutional investors like mutual funds and insurance companies which are nearly monopolized by the government in India, is also significant and comparable to the extent of their participation in Japan and Germany, but much less in scope than that in the US and UK.

Finally, to put the importance of corporate governance in India in perspective, it is important to note that as is typical in many developing countries, and unlike in developed countries, Indian corporates rely dominantly on external sources of finance, and this reliance has increased significantly since the institution of far-reaching financial sector reforms. As of 1996, more than three-quarters of total funds raised by Indian corporates were from external sources via the capital market and through bank borrowings. Hence the onus on proper governance of corporates automatically falls disproportionately on the external financiers. Among these, financial institution borrowings, like those in developed countries, have remained a significant source of external finance as compared to the equity market, although the latter's share in overall financing has considerably increased since liberalization. As of 1996, funds raised from the capital market constituted 17.4 per cent of total funds and bank borrowings (commercial banks and development financial institutions) constituted 33.1 per cent of total funds. The debt–equity ratio for our sample of corporates in 1995–6 stood at around 1.9, which shows that Indian corporates, like their developed country counterparts are substantially leveraged.

INSTITUTIONS OF CORPORATE GOVERNANCE IN INDIA

The fundamental institutions of corporate governance in India have been formally in place for a large number of years. Compared to many developing countries, corporate governance mechanisms in India are much more institutionalized. However, in spite of such institutions, corporate governance has not been an important issue until the adoption of the structural adjustment and globalization policy by the Government of India in July 1991. Since then, with India becoming more integrated with the world market, and more and more companies tapping external sources of finance from the debt and capital markets, public concerns have become more focused on the effective protection of investor interests, especially those of the small investor, the promotion of transparency of operations within business and industry, and the need to move towards international standards in terms of disclosure of information by the corporate sector. Most importantly, the role of large blockholders as banks and institutional investors has increasingly come under scrutiny in view of their reportedly passive role in the corporate governance of companies (see, for example, CII, 1998).

In India, there are primarily four avenues through which both the 'exit' and 'voice' options of outside debt holders and equity holders in corporate governance are sought to be institutionally ensured in order to make company management accountable. These are through the Companies Act, 1956; the Securities and Exchange Board of India (SEBI) Act, 1992; a market for corporate control; and through the participation of public financial institutions and institutional investors in the management of companies.

Companies Act

The activities of Indian companies are regulated through the Companies Act, 1956, the roots of which can be traced back to the Indian Companies Act, 1913. The Companies Act, 1956, is by far the largest legislation enacted by Indian parliament, comprising 658 sections and 14 schedules. Through the consolidation of many successive amendments, and a large number of statutory rules and regulations, the Act has aimed to ensure that the interests of creditors and shareholders are adequately protected and that shareholder voice is adequately represented in the management of companies. Besides, the Act has provided for a greater measure of government control over the affairs of joint stock companies that was deemed desirable in public interest. Currently, a revised version of the Companies Act, namely the Companies Bill 1997, is awaiting the approval of parliament. This Bill seeks to streamline the existing Act by reducing 658 sections and 15 schedules to 458 sections and 3 schedules, and ensuring that the new provisions provide flexibility and greater disclosure and self-regulation of Indian companies operating currently in a liberalized, fast changing, and highly competitive environment.

As many analysts have noted in their research on corporate governance issues, the most important legal right shareholders have is the right to vote on important corporate matters such as mergers and liquidations, as well as in the elections of boards of directors. Some of the legal rights that Indian shareholders have under the existing company law to ensure the accountability of management are:

Voting Rights: Every member of a company limited by shares and holding any equity share capital therein shall have a right to vote, in respect of such capital on every resolution placed before the company. All shares carry proportional voting rights. Voting through proxies are allowed.

Board of Directors: Company boards are single tiered. Each company is governed by a board of directors comprising the Chairman and the Managing Director (one person can hold both posts) and other board members who can be either executive or non-executive members. Like the UK, there is no specification about the number of executive and non-executive members. However, every public company should have at least three directors appointed by the company in general meeting. No person should be director of more than twenty companies at one time. Directors are subject to detailed disclosure requirements with respect to their financial interests in the company.

Remuneration of Directors: Executive directors may be remunerated either by way of monthly payment or at a specified percentage of the net profits of the company, or a combination of both provided that except with the approval of the central government such remuneration shall not exceed 5 per cent of the net profits if there is one such director and if there is more than one such director, 10 per cent for all of them together. Non-executive directors may be remunerated either by way of monthly, quarterly, or annual payment with government approval or by way of commission by special resolution, provided that the remuneration paid to one, or all of them taken together, does not exceed 1 per cent of the net profits of the company if the company has a managing or whole time director or manager, and 3 per cent of the net profits in any other case.

Removal of Directors: A company may, by ordinary resolution, remove a director before the expiry of his period of office subject to certain tenurial clauses like lifetime employment.

Annual General Meeting: Every company shall each year hold in addition to any other meetings a general meeting as its annual general meeting. The board of directors is also empowered to call an extraordinary general meeting.

The Companies Bill, 1997 and the most recently promulgated Ordinance on Companies (Amendment) Bill, 1997 have amended several provisions of the existing Act and introduced new provisions incorporating some internationally accepted corporate governance practices aimed at strengthening corporate democracy, protecting the interests of minority investors, and providing increasing flexibility to the corporates in responding to market conditions. Some of the key provisions are presented in Box 2. Among these, the amendments that have made headlines are allowing companies to buy back shares subject to 'prudential' guidelines and the liberalization of inter-corporate investments.

Capital Market

The history of the capital market in India dates back more than hundred years with the establishment of the BSE in 1875. However, it is only in recent years that the market has been emerging along the lines of the more advanced markets, like those in the US and UK. Table 14.4 shows some comparative indicators of the state of the Indian capital market as of 1996. As the Table shows, India has the largest number of listed companies in the world and is ranked quite high among a group of eighty-two countries in terms of market capitalization and value traded. As of 1995, market capitalization, as a percentage of GDP in India was 39.8 per cent, higher than that of Germany, France, and China. However, as the turnover statistics reveal, the capital market in India is relatively illiquid by developed country standards, although liquidity has substantially improved in recent years.

Box 2

Salient Proposals of the Companies Bill, 1997 and of Ordinance Allowing Share Buyback and Liberalizing Inter-corporate Investments

- Reduction of the size of the Companies Act, 1956, from 658 sections and 15 schedules to 458 sections and 3 schedules.
- Three-fold classification of companies—private companies, unlisted public companies, and listed companies—instead of existing four-fold classification.
- Provision for self-regulation of companies, minimum government regulation, and stricter disclosure norms for listed companies.
- Allowing companies to raise money through new instruments such as hybrids, derivatives, and options.
- Allowing Indian Depository Receipts by foreign companies.
- Allowing companies to make inter-corporate investments and loans without government approval. This provision has been promulgated into an ordinance in November 1998. Under the liberalized norms for inter-corporate investments, companies have the freedom to invest their free reserves and equity *without government approval.* Companies would also be permitted to invest beyond 30 per cent of the equity in any one company. One company can now buy 100 per cent of the equity of another company without government clearances, subject to satisfying the new norms.
- Limit on the number of public companies in which a person can be a director reduced from 20 to 15.
- Replacement of Company Law Board with a Company Law Tribunal with more functions and powers and wider jurisdiction.
- Streamlining and simplification of winding up process of companies, laying more emphasis on the employment of professionals as liquidators.
- Constituting a National Advisory Committee on Accounting Standards.
- Allowing companies to buy back their own shares. Although a company was previously allowed to repurchase its shares in the context of a reduction of capital, now a company no longer has to obtain court approval in order to purchase its own shares and no longer has to call a meeting of the creditors. However, the buyback must not exceed 25 per cent of the paid-up capital and free reserves of the company purchasing its own shares, or other specified securities, and companies are debarred from buying back through subsidiaries or through group companies.

TABLE 14.4

Stock Market Indicators of Selected Countries: 1996

	Listed companies		Market capitalization		Turnover: total value traded/market capitalization		Value traded (millions of US $)	
	No.	Rank	As % of GDP	Rank	Turnover (%)	Rank	Amount	Rank
India	8800	1	39.79	20	87.6	11	109,448	18
China	540	19	5.64	22	328.6	1	256,008	10
Germany	681	12	25.63	4	123.2	5	768,745	3
Japan	2334	4	73.88	2	37.1	32	1,251,998	2
France	686	11	35.97	5	49.8	24	277,100	8
UK	2433	3	128.59	3	36.8	34	578,471	4
USA	8479	2	96.58	1	92.8	9	7,121,487	1

Source: Emerging Stock Markets Factbook 1997, International Finance Corporation.

Stock market activities are sought to be comprehensively regulated by the Securities and Exchange Board of India (SEBI) whose functions are similar in scope to the Securities Exchange Commission (SEC) in the US. The SEBI Act of 1992 gave SEBI the statutory powers to protect the interests of investors in securities and to promote the development of, and regulate, the securities market. Prior to the SEBI Act, 1992, all issues of capital by Indian companies were controlled by the Controller of Capital Issues (CCI) who, through a set of guidelines, regulated the terms for the issue, including the price at which the issue was to be made. Under the SEBI Act, companies have been given the freedom, subject to stringent disclosure requirements, to price their issues and raise funds to meet their various types of business requirements. SEBI guidelines also contain a stipulation as to minimum promoters' contribution and lock-in period thereof. It is to ensure that the interests of the promoters of the issuing company are fairly tied up with the interests of the minority investors.

Capital market reforms since 1992 have also involved other institutional changes that have helped increase market efficiency by reducing the costs of transactions, i.e. brokerage costs, market impact cost, paperwork, fraud, and counterparty risk, in the secondary capital market. These are the introduction of screen-based trading to ensure transparency in operations, move towards nationwide integrated markets, the guaranteeing of all trades by a clearing house, and the dematerialization of securities.

The implication of capital market developments in recent years for corporate governance has been that the mechanisms available for equity governance by large and small investors alike have considerably improved relative to past standards. That is, with detailed disclosure requirements, greater investor protection, screen-based trading, and move towards integrated markets, investors are becoming increasingly well informed about true company performance and are also being able to respond quickly to any market information, good or bad. Trading volumes which were considered high at Rs 2.5 to 3 billion a day have touched over Rs 30 billion a day in recent years. Not discounting the role of investor overoptimism and speculative bubbles in a growing economy, the greater institutionalization of the Indian capital market has led to increased participation of households and institutional investors in the equity market as more and more companies have tapped the equity market for finance since 1992.

The Market for Corporate Control

The market for corporate control in India, although technically existent for a long time, has been rather inactive by US and UK standards, but certainly more active than the markets in Japan and Germany. Following economic reforms, there is now a discernible trend among promoters and established corporate groups towards consolidation of market share and diversification into new areas, albeit in a limited way, through the takeover of companies. Until recently, mergers, amalgamations, and friendly takeovers, rather than hostile ones, have been more pronounced.

Prior to the economic reforms, regulatory bodies like the Monopolies and Restrictive Trade Practices (MRTP) placed several hurdles in the way of takeovers, mergers, and amalgamations. Moreover, in the event of a hostile bid for a company, incumbent managers had the power to refuse transfer of shares to the bidder if the transfer was against the interests of the company or against public interest. However, in spite of such inconducive circumstances, takeovers, including a few hostile ones, continued to take place. Between 1988 and 1992, 121 takeovers and mergers occurred, while 37 takeover bids were unsuccessful, and since the reforms, between 1993 and 1997, 166 companies have been acquired, with nearly 85 per cent of the acquisitions taking place between 1995 and 1997. However, most of these were friendly acquisitions rather than hostile takeovers.

The first attempts at regulating takeovers in India were make in a limited way by incorporating a clause, viz. Clause 40, in the listing agreement that provided for making a public offer to the shareholders of a company by any person who sought to acquire 25 per cent or more of the voting rights of the company. Currently, takeovers are regulated through the Substantial Acquisitions of Shares and Takeovers Regulations, first promulgated in 1994 by SEBI, and then replaced by a more comprehensive act in 1997. Current regulations, by making disclosure of substantial acquisitions mandatory, have sought to ensure that the equity of a firm does not covertly change hands between the acquirer and the promoters. Moreover, the rights of existing management to withhold transfer of shares have been withdrawn, although under Sections 250 and 409 of the Companies Act, target companies can shelter against raiders if the proposed transfer prejudicially affects the interests of the company.

Under current regulations, the acquisition of 15 per cent of shares/voting rights triggers a minimum public offer of 20 per cent. Further, promoter groups holding a stake of not less than 10 per cent are allowed to consolidate their position through the provision of a 'creeping' takeover of up to 5 per cent of shares, without attracting the mandatory public offer requirement. As stated earlier, buyback of shares which was also not allowed for all this time, has been recently introduced and the takeover code will not include companies that are planning offers under the buyback norms. However, takeover defence mechanisms as poison pills for incumbent management as are present in the US and UK, are not permitted under current regulations.

Box 3
Recent Indications of More Proactive Governance by FIs

- FIs have been asked by the Finance Ministry to take 'full responsibility' for corporate governance in companies where they have substantial stakes. The objective is to boost investor confidence and pep up the capital market. The government has issued a four point directive to FIs asking them to insist on (i) making adequate disclosures, (ii) moving towards internationally accepted accounting standards, (iii) maintaining distance between the CEO and chairman where applicable, and (iv) holding regular board meetings with proper recording and dissemination of proceedings.
- FIs have in recent times pressed for change in management of underperforming and defaulting companies like those in Narmada Cement and Rajinder Steel.
- FIs have successfully opposed a move by the Associated Cement Company (ACC) to make a preferential issue to the Tata group that will enhance the latter's stake, citing as justification the need to protect the rights of minority shareholders of the ACC.
- FIs have implemented new norms for appointment of nominee directors, which have drastically cut down the total number of such directors on company boards. According to the new criteria for nomination, financial institutions are required to place their nominees only in companies where their *combined* exposure is above Rs 50 crore or their shareholding is above 26 per cent or in the event of the company showing signs of problems such as defaults on loans.
- FIs are in the process of revising guidelines for nominee directors. The IDBI is coordinating the process, and the norms will be drawn up in consultation with the Ministry of Finance and the RBI. Among the norms under consideration is one making it *mandatory* for FI nominee directors on boards of companies to attend specific board meetings, especially those related to finalization of accounts.
- FIs are insisting on setting up of audit subcommittees comprising 'adequate' number of non-executive independent directors of the company board in each and every large and medium corporate to strengthen internal control structures and safeguard shareholder interests. Constitution of an audit subcommittee, according to the FIs, would help bring in substantial financial discipline on the part of management and check against executive malpractice.
- The UTI is asking leading corporates where it has sizable stakes to make presentations outlining their plans and expected performance after the declaration of half-yearly results. The objective of the exercise is more hands-on governance to give confidence to the unit holders. Several big corporates like Reliance have made presentations to the UTI, LIC, and GIC.

Source: Collated from press reports between July 1998 and January 1999.

Nominees on Company Boards

In India, development financial institutions (DFIs) like the IDBI, ICICI, IFCI, as well as institutional investors (i.e. mutual funds and insurance companies), namely the UTI, LIC and GIC, are typically substantial blockholders in large Indian corporates. Apart from holding significant equity positions, DFIs are also major debt holders.

By virtue of financial institutions and institutional investors being equity/debt holders, nominees of such institutions are typically represented on corporate boards, as is the case in Germany and Japan. Almost all FI debt contracts until recently have carried a covenant that it will be represented on the board of the debtor company via a nominee director (CII, 1998). Recently, the FIs on the recommendation of the Basudeb Sen Committee on the nomination of directors on company boards, have decided to put nominee directors only on boards of companies where their stakes are sufficiently high. Such a policy has been adopted perhaps in view of the fact that FI nominees are relatively few in number compared to the large number of companies to be monitored.

FIs in India thus have significant voting rights, and because all are controlled by the government (falling under the aegis of the Finance Ministry) can potentially act as a single blockholder and collectively block resolutions detrimental to their interests. However, as has been many an instance in Germany and Japan, FIs in India have been perceived by and large to be extremely passive in corporate governance. As in other countries, this perception of FI passivity both with respect to debt governance and equity governance is largely based in India on anecdotal evidence, mostly in the form of newspaper reports. Attention to this problem has also been drawn by several committees, including the Bhagwati Committee on Takeovers mentioned above, and the Omkar Goswami Committee on Corporate Governance (CII, 1998). Notwithstanding the general perception of passivity of institutional holders that has proved to be detrimental to minority shareholders, signs are, emerging in recent months of a more proactive policy stance on the part of these institutions (see Box 3).

GOVERNANCE OF INDIAN CORPORATES: THE CURRENT SCENARIO

Most economists tend to agree that the ultimate objective of good corporate governance is to maximize shareholder value. Since it is the shareholders who are the ultimate owners of the company, the terms shareholder value and company value are often used synonymously. Recently there has been an alternative view that argues that good corporate governance should go beyond maximizing shareholders' interests and encompass the interests of other stakeholders of the company, namely the employees, suppliers, and purchasers from the firm as well. However, this view has not drawn much attention because of the difficulty of implementing such an objective. The vast empirical literature on corporate governance therefore continues to accept the maximization of shareholder value as the prime objective of good and effective governance.

In Chart 14.1 we have highlighted the different channels through which corporate governance works. One of the most important of these is the ownership pattern of the company. Not surprisingly, the relation between ownership pattern and company value has received much attention in the empirical literature. In this section we present empirical evidence regarding this issue by analysing the relation between the market value of the company and its equity and debt holding pattern. The analysis is based on data for a sample of 1613 listed manufacturing companies presented in Table 14.2. The sample includes 580 domestic private companies belonging to business houses, 943 domestic private stand-alone companies, 39 foreign companies belonging to business houses, and 51 foreign stand-alone companies. The year of analysis is 1995–6. Since our focus is to analyse the predictable effects of a company's ownership structure on its value, it is appropriate to look at the cross-sectional relationship between ownership and value. Indeed, the study of this cross-sectional relationship has been the focus of a large number of empirical studies on corporate governance.

We will use the market to book value ratio (MBVR) to measure the value of a company. MBVR is defined as the ratio of the product of the number of equity shares and the market price of the share to book value of equity and reserves. Commonly, MBVR is referred to as the price to book value ratio or the P–B ratio. The market price of the share reflects the sum of discounted cash flows that the holder of the share expects to get by holding the share forever. The book value of the share reflects the cost at which the share was bought. Thus the P–B ratio summarizes the lifetime return from holding the share and is a good measure of company value from the viewpoint of a shareholder. In the finance literature, Tobin's Q, which is defined as the ratio of market value of equity plus the market value of debt to the replacement cost of assets has been widely used to measure company value. Since we do not have data on the market value of debt[6] nor on the replacement cost of assets, we do not use Tobin's Q in our analysis. The MBVR, though not quite Tobin's Q, has been used in many empirical studies to measure company value.

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[6] In many developing countries, certainly in India, since a large proportion of corporate debt is institutional debt that is not actively traded in the debt market, it is very difficult, if not impossible, to calculate the market value of debt.

In addition to market-based indicators, the empirical literature sometimes uses the accounting indicator return-on-networth (RET–NW) to measure company performance. This is defined as profit after tax divided by the sum of equity capital and reserves and reflects the return on shareholders' capital. However, in general, market-based indicators are preferred to accounting indicators while analysing company value for at least two reasons. First, while accounting indicators incorporate only current information regarding the performance of the company, market-based indicators incorporate both current information as well as future prospects and as such are likely to better reflect the overall financial health of the company. Second, market-based indicators reflect the valuation of the company by a large number of independent investors and are therefore likely to be more accurate than accounting indicators which may be subject to accounting practices specific to the company. Ideally, and under strict International Accounting Standards adopted by most developed countries, accounting indicators should be highly correlated with market-based indicators. However, in India, this has bot been the case (see Box 4). This could primarily be due to the fact that companies in India do not follow uniform accounting standards, and though suitably modified standards and practices as set by the International Accounting Standards Committee (IASC) exist, it is not as yet mandatory for companies to follow these standards. Under these circumstances, there is scope for 'window dressing' and as such accounting indicators may be ill suited to compare the relative performance of companies. We, therefore, do not use accounting indicators in our analysis.

From Table 14.2 in the third section we know that the ownership structure varies quite significantly across the different groups of companies. We now ask the question, 'Does the performance of companies also vary across different groups of companies?' If we find that the performance of companies indeed varies across the different groups, we may then try to further analyse the nature of this variation for different groups. On the other hand, if there are no differences in performance of companies belonging to the different groups then we ought to conclude that all types of ownership are equally effective (or ineffective) in influencing company value.

Performance of Different Ownership Groups

Table 14.5 clearly illustrates that foreign companies, both group and stand-alones, have a market valuation that is much higher than domestic private sector companies, whether group or stand-alone. Thus while foreign group companies, on an average, have an MBVR (in percentage) of 345 and foreign stand -alones 405, the corresponding figures for domestic companies are 143 and 99 respectively. Thus foreign companies, on an average, have an MBVR that is three to four times the MBVR of domestic companies. Within domestic companies, group companies, on an average, are valued one-and-a-half times stand-alone companies. However,

Box 4

How Well Related are Accounting and Market-based Indicators?

In the Table below, we have computed the correlation between the market-based indicator, MBVR, and alternative profit-based accounting indicators.

	Correlation of MBVR with			
Company type	PAT/NW	PBT/NW	PBDT/NW	PBDIT/NW
Private business houses	–0.04820	–0.01291	0.16428	0.46154
Private Stand-alones	0.02862	0.04569	0.10716	0.23400
Foreign business houses	0.41875	0.48520	0.64708	0.57987
Foreign stand-alones	0.15624	0.24604	0.30894	0.46693
All companies	0.02513	0.07026	0.18943	0.36488

Notes: PAT=profit after tax, PBT=profit before tax, PBDT=profit before depreciation and tax, PBDIT=profit before depreciation, interest, and tax, NW=net worth (equity capital+reserves).
Source: Authors' calculation based on the sample.

Observations

- The correlation between MBVR and PAT-NW is very low for domestic private companies. For companies belonging to business houses this correlation is actually negative.
- The correlation increases as one moves to a broader definition of profits. For foreign companies belonging to business houses, the correlation is high irrespective of the measure of profit used.
- The behaviour of the correlations suggests that the largest distortion between market and accounting indicators occurs due to tax and depreciation provisions.

within foreign companies, stand-alone companies appear to be valued higher than group companies, though the difference between these two groups is less pronounced than that between domestic private sector companies. Based on MBVR, the performance ordering of the different groups is: foreign stand-alone, foreign group companies, domestic private group companies, and domestic stand-alone companies.

TABLE 14.5
Performance of Different Types of Companies

Type of company	Mean MBVR (%)
Private companies belonging to business houses	143.4
Private stand-alone companies	98.5
Foreign companies belonging to business houses	345.1
Foreign stand-alone companies	405.8
All	130.9

Thus our first analysis of the performance of the Indian corporates suggests the existence of wide divergence between the four broad groups of companies. Based on MBVR, foreign stand-alone companies perform the best, followed by foreign group companies, domestic private group companies, and lastly stand-alone companies. If we now reason that the performance of companies is to a large extent determined by ownership structure of the company and recall our earlier description of the ownership structure of the Indian corporates, we get our first glimpse of the effectiveness of different ownership groups in influencing company value in India. Foreign ownership seems to be the most effective, followed by ownership by corporate bodies. Holdings by directors and relatives do not seem to have a strong impact on company value.

Extent of Shareholding and Performance

Till now, we have tried to link the influence of different types of shareholders on company value by looking at the performance of different groups of companies which have quite distinct ownership patterns. Why not look directly at the relation between the extent of shareholding by each type of shareholder, i.e. directors and relatives, corporate bodies, foreign bodies, financial institutions and institutional investors, and company performance and see what type of influence each group has on company value? This will give us a fairly clear idea about the influence or effectiveness of different types of shareholders on company value. Also, as the finance literature suggests, the incentive of a particular type of shareholder, say directors and relatives, is likely to change with the *extent* of ownership in the company, so that the relation between ownership and performance is better analysed by considering company performance for different blocks of holdings.

To do this we consider each group, say holdings by directors and relatives, and classify the companies into five categories depending on the extent of holding by directors and relatives. We then look at the performance of the companies in each of these five categories. A more rigorous analysis of the relation between the extent of holding by one particular group of shareholders and company value will control for the composition of and extent of holding by other shareholders. In addition, there will be control for other factors, like size of the company, the industry to which the company belongs, and type of technology that the company uses, in the analysis. We are abstracting from these to keep our current analysis simple and mostly expository in nature. For a more rigorous analysis see Sarkar and Sarkar (1999).

Directors' Shareholding and Company Value

The mean value of MBVR for companies by different holding categories is graphed in Figure 14.1. As can be seen, an increase in holdings by directors and relatives, commonly known as insider holdings in the literature, actually reduces company value in India, as long as the holding does not exceed 25 per cent. After that, an increase in holdings by directors and relatives has a positive effect on company value. This finding of a negative relation at low level of holdings and a positive relation at higher levels of holdings has also been seen in other countries. Directors and relatives may primarily be interested in maximizing their own private interests at the expense of the other shareholders, when they have less stake in the company. However, as their stakes increase, the interests of the directors and the managers coincide with the interests of the shareholders and have a positive effect on company value.

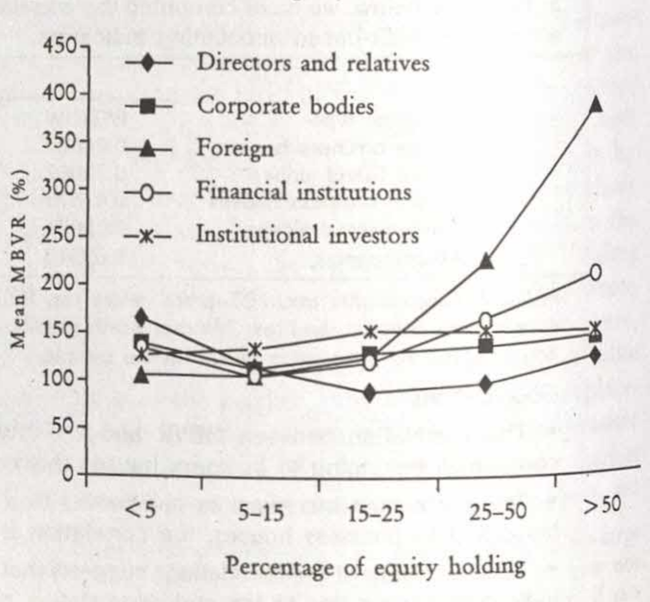

Figure 14.1 Relation between Equity Holding and Company Value

Corporate Bodies and Company Value

Like the behaviour of holdings by directors and relatives, increase in holdings by corporate bodies too reduces company value initially, but its positive effect starts operating much earlier than occurs for holdings by directors and relatives. Compared to 25 per cent for directors and relatives, the positive effect of corporate bodies starts operating once their holdings cross 15 per cent. Also, the effect of corporate holdings on company value is higher than the effect of directors' holdings, at higher levels of holdings.

Foreign Equity and Company Value

Coming to the effect of foreign ownership on company value we see that unlike the case for directors and relatives and corporate bodies, an increase in holdings by foreign bodies does not reduce company value at lower levels of equity ownership. There is a monotonic relation between the extent of foreign holdings and company performance. Also, the effect of foreign ownership gets more pronounced with an increase in the extent of holdings. For companies with shareholding between 25 and 50 per cent, while the mean MBVR with respect to corporate body holdings is around 140, the mean MBVR with respect to foreign holdings is around 230. This difference becomes even sharper for companies with shareholding above 50 per cent.

Financial Institutions, Institutional Investors, and Company Value

The effects of holdings by financial institutions and holdings by institutional investors are given separately in Figure 14.1. Like corporate bodies increase in holdings by financial institutions reduces company value for holdings below 15 per cent but increases it thereafter. The effect of holdings by financial institutions on company value increases significantly once their holdings cross 25 per cent, and is in fact much greater than the effect of holdings by corporate bodies.

Coming to institutional investors, a significantly different pattern can be observed. While an increase in holdings by these institutions seems to have a uniformly positive effect on company value for low levels of holdings, the sharp increase in effect at higher levels of holdings that we observe for other types of holdings is absent for institutional investors. In fact, with respect to institutional investors, the mean MBVR of companies in which institutional investors hold more than 25 per cent equity is actually lower that of companies where they hold between 15 and 25 per cent of equity, though the difference is not very large.

Our analysis of the role of financial institutions and institutional investors seems to suggest the former to be more effective in influencing company value at high levels of equity ownership. There may be two reasons for this. The first could be the fact that market pressures may be working on financial institutions which have recently gone to the capital market for raising resources with the government divesting a certain percentage of equity. In contrast, the mutual fund industry has remained completely government controlled and virtually monopolized. The other, and perhaps more important, factor could be that significant debt holdings by financial institutions reinforce their incentive to monitor and exercise their voice option more effectively relative to institutional investors.

The Dual Effect of Debt and Equity Holding by Financial Institutions

Does debt holding by financial institutions reinforce their incentive to monitor company value and ultimately make the companies perform better? Or is it that most of the governance comes from equity? Which type of ownership has a stronger effect, debt or equity? Figure 14.2 gives, for all the domestic companies in our sample, the distribution of companies according to the share of institutional debt to total long-term debt. This distribution is given for category of equity holding. In more than 60 per cent of the companies in our sample, the share of institutional debt is higher than 50 per cent. Of particular significance is the fact that the percentage of companies in which the share of institutional debt is more than 50 per cent actually increases with the extent of equity ownership except for the last equity class where it is 71 per cent. Thus Figure 14.2 clearly highlights that financial institutions own a very

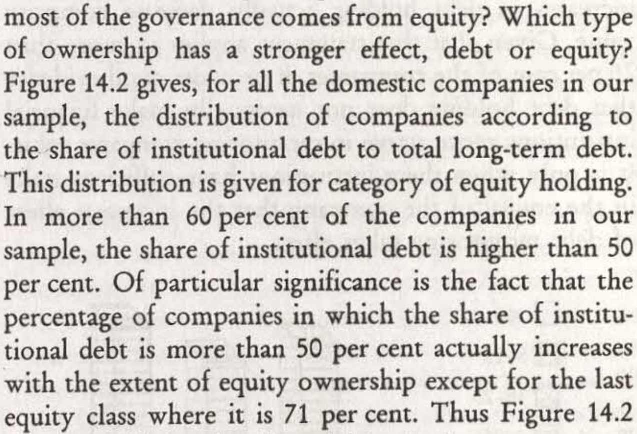

Figure 14.2 Distribution of Companies according to Equity and Debt Holdings

significant, and remarkably similar, portion of the total long-term debt of Indian corporates, irrespective of their equity holdings.

The last statement already gives us some indication about the effectiveness of debt holding vis-à-vis equity holding in monitoring company performance. We have earlier seen that company value increases with increase in the extent of equity holding by financial institutions. Now, if financial institutions hold similar levels of debt for *every* class of equity holding, then it must imply that, on an average, debt holding has no significant effect on influencing company value.

Figure 14.3. illustrate this point. The figure supports our earlier finding with respect to equity holding by financial institutions. A rise in equity holding increases company value for all levels of debt holding. However, the same is not true for debt holding. Increases in debt holdings increase company value for only high levels of equity holdings. For low levels of equity holdings, increases in debt holding actually decrease company value. Given that this statement applies to more than 70 per cent of the companies, it provides good evidence that debt holding does not necessarily make financial institutions more active in monitoring company value. It is only when these institutions have sufficient stake in the equity of the company that the incentive effect of debt monitoring takes effect.

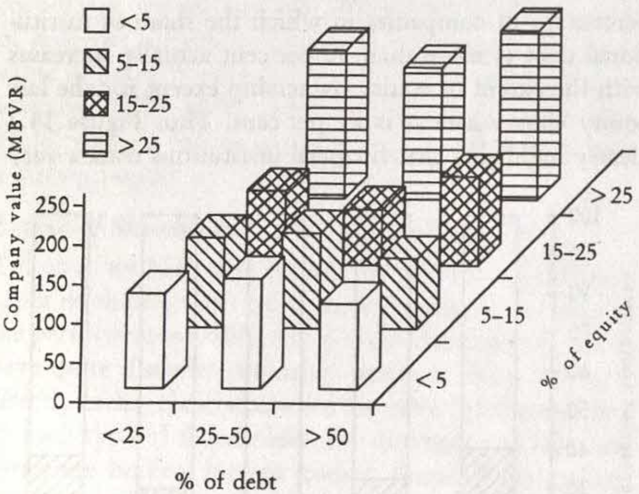

Figure 14.3 Company Performance according to Debt and Equity Holdings

EMERGING POLICY ISSUES

In this chapter, our focus, as economists, has primarily been on the effectiveness of governance in India rather than on the institutional mechanisms of governance. The latter is a vast interdisciplinary subject that requires the inputs and deliberations of accountants, lawyers, academicians, politicians and many other professionals, and much of it is uncharted territory. The chapter analysed the extent to which different shareholders of Indian corporates influence company value. This, as we have argued, is one of 'reduced form' tests to reveal the quality of governance by shareholders. Our empirical analysis confirmed some of the widely held notions about how Indian companies are governed. At the same time, however, it has put question marks on some myths regarding the governance of these companies.

Our finding indicates that company value is low when promoters have low stake in the company. Since control of such companies can still be in the promoters' hands because of the dispersed nature of shareholding, such companies should be subjected to more vigilant external monitors like financial institutions and institutional investors and to the discipline of an active market for corporate control. However, as the promoters' stakes increase beyond a threshold, consistent with agency theory, there is a positive effect on company value. In this context, it is perhaps appropriate to draw attention to the debate regarding the consolidation of promoters' stake in companies through routes like creeping acquisitions and buyback of shares. What our analysis suggests is that the effect of consolidation on company value depends on the *post-acquisition stake* of promoters. To the extent such post-acquisition stake remains below the threshold levels that we have observed in our analysis, we need to be watchful about such events.

Recently, some chambers of commerce have argued for policies that will protect domestic companies from hostile takeover threats from cash rich multinationals claiming that the management 'gets distracted,' and its productive energies get spent in warding off such bids. For instance, one chamber has suggested that a 'cooling period' of at least five to ten years be provided in the case of first generation promoters to ensure that they are not taken over by large corporate predators. The chamber has said in a statement that in the absence of a threshold period of exemption, there is likelihood of successful projects attracting hostile takeover bids. Another chamber, in its pre-budget memorandum, has asked the government not to permit hostile takeovers by foreign companies and has proposed retaining the existing provision of getting the permission of the board of the targeted company for the purpose. Our analysis shows that such suggestions, if implemented, are likely to compromise the interests of minority investors in companies with low promoter stakes in which we have found an inverse relationship between director holdings and company value. Such companies constitute about 30 per cent of our sample.

Further, it is our view that the current provision of requiring the permission of the target company's board in case of takeover bids by foreign companies is unduly protective towards incumbent management as it fails to hold the board accountable for the underperformance of the management whose inefficiency could have triggered the hostile bid in the first place. While theoretically, too much of a takeover threat can lead to managerial myopia, evidence with respect to the US market suggests that such a concern was 'exaggerated' even during the 1980s when there was a wave of hostile takeovers (Shleifer and Vishny, 1977b).[7] Moreover, contrary to the apprehension that liberalized takeover regulations will lead to a spate of hostile takeover bids even for potentially well-performing domestic companies, such takeovers in any case continue to remain low relative to those in the US and UK. According to the data collated by SEBI, of the total 71 public offers received, only 7 were hostile bids, while 45 were friendly takeovers, and 19 were offers for consolidation. Multinational corporations made 19 offers out of which 9 were friendly takeovers and 8 were offers for consolidation. Among the seven hostile bids, the bid for Raasi Cement by India Cements was the only successful one, and the hostile bid by the multinational ICI to buy 9.1 per cent of Asian Paints was blocked by the Foreign Investment and Promotion Board of the Government of India because the latter company's board refused to support the move.

Our finding of the role of corporate bodies in the governance of companies portrays a non-linear relationship with company value increasing with corporate shareholding beyond a threshold. However, the effect of corporate holdings on company value appears to be much stronger than it is for promoters' holdings. In this light, the recent liberalization of norms for intercorporate investments does have some merit.

Our analysis of the role of financial institutions confirms the popular wisdom among policy analysts these days that these institutions should be actively involved in governance through nominee directors only in companies where they have sufficient stakes. Our analysis shows that even way back in 1995–6, when the general perception was that financial institutions were by and large passive even in companies with substantial stakes, their presence positively impacted company value. On the other hand, the impact of institutional investors, primarily the UTI, as reflected in our analysis, leaves much to be desired. The role of institutional investors in the governance of corporates has come under the arclights even in the case of developed countries. Several research papers and books have been devoted to the subject in the US and UK, highlighting the passivity of such investors and suggesting ways to improve their governance (see, for example, Black, 1998; Blair, 1995). The success of CalPERS, which is a public employee pension fund in the US, has been cited as an example of an active institutional investor which has spearheaded many governance reform campaigns in companies where it has substantial stakes. In this context, the recent active stance formally adopted by the UTI in closely monitoring the performance of high profile corporates, and in supporting the takeover of weak companies, is obviously welcome.

Finally, our analysis has thrown some light on the importance of the disclosure of information regarding performance of companies. As we have seen above, there are grounds to believe that accounting information does not necessarily reflect the true worth of the company. One way out of this is the adoption of International Accounting Standards by Indian companies and the strengthening of auditing procedures through the formation of audit subcommittees to ensure the disclosure of comparable, consistent, and complete information. The task here is particularly challenging given that international best practice mechanisms are continuously evolving even in rather mature capitalist economies like the US and UK. Despite the perception that disclosure norms are very stringent and transparent in the developed countries, the set of rules and reporting systems that determines the dissemination of information to shareholders in these countries has always been found to be less than optimal. Major complaints in the US, for example, are that accounting procedures are too flexible and permit companies to hide problems for too long; that major accounting firms which handle the bulk of the auditing work of publicity listed companies are too cozy with their clients, not flagging potential problems and glossing over actual problems; and that accounting methods often provide irrelevant and unhelpful information (Blair, 1995). In India, SEBI has been extremely active in improving disclosure norms that include among other things quarterly reporting of financial results by listed companies. The focus should be on disclosure of 'quality' information that is relevant for assessing the worth of a company rather than on the quantity of information.

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[7] Shleifer and Vishny's (1997b) study is based on sixty-two hostile bids in the US between 1984 and 1986 when around $ 69 million of assets changed hands. Apart from not finding evidence of corporate myopia, the authors have not found evidence of adverse employment effects and reduction in market competition following hostile takeovers.

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15

Insurance

Ajit Ranade and Rajeev Ahuja

INTRODUCTION

Insurance is a Rs 400 billion business in India, and together with banking services adds about 7 per cent to India's GDP. Gross premium collection is about 2 per cent of GDP and growing between 15 and 20 per cent per annum. India also has the highest number of life insurance policies in force in the world, and the total investible funds with the Life Insurance Corporation of India (LIC) are almost 8 per cent of GDP. Yet more than three-fourths of India's insurable population has no life insurance cover. Health insurance of any kind is negligible, and other forms of non-life insurance are much below international standards (see the sixth section and Table 15.6 for details).

The potential for the growth and spread of life insurance is high, as in many other Asian countries, due to stronger economic growth, rapid ageing of populations, and a weak social security and pension system which leaves a vast majority of workers with no old age income security.[1] However, greater spread and deepening of insurance in India would need reforms which include revitalizing and restructuring of the public sector companies, and opening up the sector to private players. As a signatory to the WTO's General Agreement on Trade in Services, which includes banking and insurance, foreign companies are expected to play a role in insurance in India. Several governments which tried to initiate the process of reforms in this sector have run into political roadblocks, slowing down the process of private entry.[2] Reforms in insurance are to be seen as an integral part of the ongoing reforms in the overall financial sector which cover banking, capital markets, currency markets, and so on.

A well-developed insurance sector promotes economic growth by encouraging risk-taking activity, and also has great potential as a mobilizer of long-term contractual savings. The latter are crucially needed for infrastructural development. Commercialization of infrastructure provisioning has become an economic reality. Several factors have contributed towards the shift in thinking away from the traditional approach that regarded government as the main provider of infrastructure. Some of these factors are: massive investment requirements against a background of fiscal stringency, greater awareness of the importance of efficiency in infrastructure investment and delivery, changing technology making it easier to have user charge, and increased possiblity of raising large funds for infrastructure investment on a commercial basis. The demand for long-term investment funds is ever growing.[3] While banking institutions mobilize short- and medium-term savings, contractual savings institutions (such as insurance companies and pension and provident fund) because of their long-term liabilities are natural investors for infrastructure projects. Contractual savings institutions can also play a major role in vitalizing the secondary long-term debt market and also, if the investment norms permit, the securities market. To this end of spreading and deepening of insurance, vigorous reforms are necessary in India's insurance sector. The government-appointed Committee for Reforms in the Insurance Sector which submitted its report (GOI, 1994) in early 1994 had recommended ending the state monopoly and setting up a strong regulatory body.

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[1] In this chapter we exclude from our analysis aspects of social insurance, such as health and income security for the poor, the disabled, other weaker sections of society, and other vulnerable groups. For a discussion of social insecurity in India, see the related chapter on poverty and insecurity in this volume.

[2] See the eighth section for a discussion of the political economy of reforms in the insurance sector.

[3] A government-appointed committee, authors of the India Infrastructure report (GOI, 1996), estimated a requirement of Rs 12,000 billion over the next ten years. Most of this will have to be financed through domestic long-term contractual savings, and not foreign sources. The current mobilization through life insurance and provident and pension funds is about Rs 100 billion per year.

This chapter is an attempt to bring together various aspects of insurance business in India including the issue of reforms. In the next section we present basic concepts in life and non-life insurance and also describe the role of life insurance, in particular, as a savings instrument. In the section after, we examine the question of what should be the appropriate market structure in insurance. The fourth section highlights the regulatory issues and the following section contains a description of the current insurance sector including a brief historical detour describing the development of insurance. The sixth section contains international comparisons. The seventh section contains a discussion of key emerging issues such as demographic changes and pension system reform, merging of life and non-life insurance, and so on. The section after briefly describes the political economy of insurance reforms in India and the last section concludes.

INSURANCE BASICS

Most people prefer to avoid risks, whether of bancruptcy, illness, disability, accidents, damage to property, or uncertain hazardous outcomes in general. Such preference, or risk aversion, is expressed as a willingness to pay a *premium* in exchange for an insurance cover. Any risk-averse person who has a possibly fluctuating income would rather pay some premium in order to trade off uncertain income for certain income. When there are many such risk-averse persons, an insurance firm by pooling of risks can assure expected value of income to each person. This would indeed be the case when an insurance firm charges actuarially fair price (price at which total premium collected by a firm equals its total claim payments) from every buyer and compensates fully those who actually suffer the loss insured against. At this price the firm makes zero profits, which would happen when the insurance firm is operating in a competitive insurance market.

Notice two things. One, the above result, namely that everyone who buys insurance gets expected value of its income, assumes that risks of the buyers are independently distributed. However, if risks are not independently distributed and if losses are correlated across persons, it might not be possible to fully compensate the loss. Two, it is assumed above that the insurance firms do not incur any cost in organizing their activities. In reality insurance companies do incur transaction costs which they add to the actuarially fair price.

The assumption of a competitive insurance market not only means that there are a large number of buyers of insurance (which is essential for the law of large numbers to be applicable) but also that each firm is a price taker and that there is free entry and exit of firms in the insurance market.

Supposing an existing insurance contract offered in an insurance market is just breaking even. However, if it is possible to offer another contract which is preferred by at least some of the existing buyers and which either breaks even or yields positive profits, then the former contract cannot represent an equilibrium contract. This is because a new entrant firm in the insurance market would lure away customers by offering this alternative contract and make a profit or, at least, break even. This may happen irrespective of the consequence for the viability of the former contract. This possibility arising from the informational asymmetry between insurer and insurees is explained in the third section.

Life and Non-life Insurance

Insurance contracts are typically classified as life and non-life. Life insurance in particular provides protection to a household against the risk of premature death of its income earning member. In traditional societies such as India, the joint family system itself provided an insurance umbrella and succour to surviving family members. A simple mathematical device that explains why joint families would require less market insurance could be as follows. Imagine a joint family household of n earning individuals, whose income generation is given by independently (and say identically) fluctuating random variables x_1 to x_n. The per capita income of this household is $(x_1 + x_2 + \dots + x_n)/n$ which is much more stable (less variance) than all the individual *x*s. When such a household breaks up into n households, there is increased risk (greater variance) and hence greater need to buy market insurance. In modern times such arrangements are now increasingly made through the market mechanism by 'buying insurance'.

Life insurance also covers risk of unexpected longevity[4] when a person has outgrown other sources of income. Non-life insurance covers risks of illness, accident, property damage, and other such hazardous occurrences. Non-life insurance contracts are typically shorter in duration than life insurance contracts. Accordingly, assets of non-life insurance companies are of shorter duration, and hence more liquid, than those of life insurance companies. Also, long-term duration of life insurance contracts requires greater solvency concern of the regulatory authority.

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[4] Such a risk of longevity is covered by insurance contracts which offer post retirement pension plans or annuities.

It is said life insurance is sold, not bought. This is probably because of people's unwillingness to contemplate their own long-term adverse predicament. If the spread of insurance is inhibited not by a lack of demand (say due to low per capita incomes), but by supply constraints (caused by inadequate incentives to commission agents, or lack of product variety) then opening up insurance business to many competitive players spurs growth of insurance.[5]

Savings and Insurance

An insurance contract provides risk coverage to the insuree. When, however, the contract period covers a long time, as in the case of life insurance, premium payments have two components. One goes towards buying risk coverage and the other goes toward savings. This savings component of life insurance pits the insurer in direct competition with other financial institutions and savings instruments, such as bank deposits, equities, and mutual funds. Since an increasing proportion of life insurance business involves pensions and annuities (insurance against 'old age') buying life insurance has elements of an investment decision.

The bundling together of risk coverage and savings is peculiar to life insurance, especially in developing economies.[6] A bank depositor can reclaim savings any time on 'demand'. In case of life insurance, the insuree cannot reclaim the savings component without some penalty. Such recall of the savings embodied in premium payments amounts to cancelling or renegotiating the insurance contract, and hence the penalty. There is thus a lock-in effect involved in signing insurance contracts.

The savings linked life insurance contracts are pervasive. There are other short duration life insurance contracts devoid of any savings component. The savings component, and the typically long-term nature of the contract, make life insurance an important instrument of mobilizing long-term funds.

Given the link between savings and premiums as explained above, any analysis of insurance business has to be seen in the context of all other savings activities of households. In a macroeconomic sense the link between high growth rates and savings is well known from classical growth theory. In the context of India, Patel (1997) indicates that a growth rate of 8 per cent is possible only with a savings rate of 30 per cent. Gross savings in the economy are made of savings from the public sector, the private corporate sector, and the

TABLE 15.1
Composition of Household Savings

	1980–1	1990–1	1991–2	1992–3	1993–4	1994–5	1995–6	1996–7*
Gross saving ratio (GDS/GDP)	21.2	24.3	22.9	22.0	22.7	25.6	25.3	26.1
Household savings/GDS	75.9	84.3	77.4	80.4	81.5	79.1	74.4	77.8
Composition of household savings (per cent)								
Share of financial savings (FS) in total savings	39.41	45.34	56.82	52.39	63.15	55.73	45.49	52.65
which consist of								
Currency	7.4	5.7	7.5	5.3	8.9	8.1	7.9	5.2
Net deposits	13.7	10.2	13.3	15.9	21.9	16.5	12.5	23.1
Shares and debentures	2.0	7.7	14.5	11.1	9.9	7.9	3.8	3.7
Net claims on government	2.6	6.7	4.1	2.8	4.1	6.6	4.4	4.5
Life insurance funds	3.9	4.9	6.1	5.4	6.1	5.6	6.3	6.0
Provident and pension funds	9.7	10.2	11.4	11.9	12.2	10.9	10.6	10.1
Share of life insurance in FS	9.98	10.74	10.66	10.35	9.73	10.12	13.94	11.44
and Savings in physical assets	60.6	54.7	43.2	47.6	36.9	44.3	54.5	47.4

Note: *Provisional.
Source: National Accounts Statistics, EPW Research Foundation (1998).

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[5] See Outreville (1994) for an anlysis of determinants of the spread of insurance in developing countries.

[6] See Ahuja (1998) for implications of bundling savings and insurance contracts.

household sector. In 1996–7, of the total gross domestic savings of Rs 3338 billion, the proportion contributed by the household sector was 78 per cent. Table 15.1 indicates the trend of savings in the 1990s.

Household savings comprise two components: (a) physical which includes land, gold, etc.; and (b) financial which includes bank deposits, life insurance, provident and pension funds, equities and debentures, small savings certificates, and mutual funds. The composition of household savings has undergone substantial change in the last two decades. In 1980–1 financial assets of households accounted for 39.4 per cent of household savings, going up to 63 per cent in 1993–4 and down to 45.3 per cent in 1995–6 and up again to 53 per cent in 1996–7. Household savings in financial assets have increased from Rs 86 billion in 1980–1 to Rs 464 billion in 1990–1 and then to Rs 972 billion in 1995–6. Within the category of financial assets, savings in life insurance were almost 10 per cent of total financial assets in 1980–1 and increased to 14 per cent in 1995–6 (see Table 15.1).

As seen from Table 15.1 life insurance continues to be a significant part of household financial savings. While financial savings as a fraction of total household savings have gone up in the last decade, the fraction devoted to insurance has remained constant at almost 10 per cent of all financial savings. The total insurance funds raised every year in the country are made up of various components which includes life, postal, and state insurance (see Table 15.2). The break up of insurance funds into various components is shown in Table 15.2 which also shows that the percentage of financial savings in life insurance has remained roughly at 10 and percentage in provident and pension funds has declined from a high of 28 in 1988–9 to 19 in 1996–7.

Asian economies which have shown high growth have also exhibited high savings rates, which in turn have contributed to economic growth through capital formation. For this to occur it is important that the savings are more of the long-term contractual kind (such as in the form of life insurance), rather than short-term bank based. There is a two way relationship between growth of life insurance institutions and growth in per capita GDP.

SCEPTICISM ABOUT MARKET STRUCTURE

What is the appropriate market structure for insurance markets? Should it be a monopoly (state or regulated), or should there be unlimited private entry, or should there only be a few regulated players? This question which is more pertinent for the non-life business such as health and motor vehicles, hinges around the issue of *adverse selection* described below.

Individuals buying an insurance contract pay a premium to the insurance company and the insurance company in turn, provides compensation if a specified event occurs. By making such contractual arrangements with a large number of individuals and organizations the insurance company can spread the risk. The premium charged by the insurer is based on average risk. Typically this premium is too high for people who perceive themselves to be in a low risk category. If the insurer cannot accurately determine the risk category of every customer and prices insurance on the basis of average risk, he stands to lose all the low risk customers. This in turn increases average risk, which means premia have to be revised upwards, which in turn drives away even more customers, and so on. This is known as the problem of *adverse selection*. Such a problem arises when a seller of insurance cannot distinguish between

TABLE 15.2

Insurance, Provident, and Pension Funds

(Rupees crore)

	Total insurance (1)	Life (2)	Postal (3)	State (4)	Provident & pension	Total financial savings (FS)	Share of insurance in FS	Share of provident & pension in FS
1980–1	915	821	24	70	2122	8610	9.54	24.65
1990–1	5599	5030	133	436	11,155	49,700	10.12	22.44
1991–2	7003	6388	165	450	12,501	62,139	10.28	20.12
1992–3	7114	6440	182	492	14,814	65,395	9.85	22.65
1993–4	9548	8784	222	542	18,226	94,517	9.29	19.28
1994–5	11,370	10,439	258	673	21,295	108,893	9.59	19.56
1995–6	13,894	12,934	324	636	22,292	95,715	13.51	23.29
1996–7	16,188	15,127	335	726	26,248	136,644	11.07	19.21

Note: Total insurance funds raised (1) = (2) + (3) + (4).

Source: Same as Table 15.1.

the buyer's type, i.e. whether the buyer is a low risk or high risk type. In the extreme case, it may lead to complete breakdown of insurance market.

Another phenomenon, the problem of *moral hazard* in selling insurance, arises when the unobservable action of the buyer aggravates the risk for which insurance is bought. When an insured car driver exercises less caution in driving, compared to how he would have driven in the absence of insurance, it exemplifies moral hazard.

Given these problems, unbridled competition among a large number of firms is considered detrimental for the insurance industry. Furthermore, even the limited competition in insurance needs to be regulated. Insurance companies can differentiate among various risk types if there is a wide difference in risk profile of buyers insuring against the same type of risk. Where such is not the case, unlimited competition may lead to price undercutting, pushing the insurance firms dangerously close to bankruptcy. This is where regulation of competition either by setting price floors, or limiting the competition by keeping industry structure somewhat monopolistic, or by standardizing insurance contracts becomes necessary. Some of these regulatory details are discussed in the following section. Empirically industry structure in various countries shows a relatively high concentration in life insurance business. Even though there are more than 1200 active life insurance companies in the USA, the ten largest companies held 43 per cent of total industry assets in 1990. The market share of the ten largest companies in terms of premium is 53 per cent in case of Australia, 72 per cent in the Philippines, and 90 per cent in case of Singapore.

The answer to the question whether insurance should remain a state monopoly is fairly obvious. When traditionally public sector businesses have allowed private entry, i.e. if airlines, telecom, banking, power, and even postal services (courier) can have private players, why must insurance remain a state monopoly? There are several other factors that call for private sector presence. First, a state monopoly has little incentive to innovate or offer a wider range of products, at fair prices and attractive commission rates. Second, competition brings more products with more complex and extensive risk categorization, better technology (telephonic and computerized), and better consumer service including faster settlements. The insurance reforms committee (GOI, 1994) recommended that private insurers be allowed to coexist with state-controlled LIC and GIC, along with setting up of a regulatory body. It recommended that a limited number of high capital, private companies be licensed, and no firm be allowed to operate in both life and non-life insurance. The high capital requirement is motivated by making sure that insurers have 'deep pockets', i.e. are adequately solvent, and the reasons for not allowing the same firm to operate both in life and non-life are that it could lead to monopolistic tendencies and that the asset–liability matching strategies for life and non-life business are radically different.

REGULATORY FRAMEWORK

An insurance contract is a 'promise to pay' contingent on a specified event. In the case of insurance and banking, smooth functioning of business depends heavily on the continuation of the trust and confidence that people place on the solvency of these financial institutions. Insurance products are of little value to consumers if they cannot trust the company to keep its promise. Furthermore, banking and insurance sectors are vulnerable to the 'bank run' syndrome, wherein even one insolvency can trigger panic among consumers leading to widespread and complete breakdown. This implies the need for a public regulator, but not public provision of insurance.

The insurance reforms committee called for statutory status to the Insurance Regulatory Authority (IRA) and suggested that it be self-financing for reasons of autonomy. The committee recommended restricted entry, as against free entry, in the insurance market for ensuring strong insurers.

The role of the IRA can be seen as comprising the following three functions: (a) the protection of consumers' interest; (b) to ensure financial soundness of the insurance industry; and (c) to ensure healthy growth of the insurance market.

Protection of Consumer Interests

Protecting consumer interests involves proper disclosure, keeping prices affordable, some mandatory products and standardization, and most importantly making sure that consumers get paid by insurers. Disclosure regulation requires insurers to frame transparent contracts. The job of keeping prices reasonable is relatively easy, since competition among insurers will not allow any one company to charge exorbitant rates. The danger often is that prices may be too low and might take the insurer dangerously close to bankruptcy. As for mandatory products, those that involve common and well-known risks, certain standardization can be enforced.

From the consumer's point of view the most important function of the IRA is ensuring claim settlement. Quick settlement without unnecessary litigation should be the norm. For example in motor vehicle insurance, adopting a no fault principle can speed up many settlements. Currently the LIC in India has a claims settlement ratio of 97 per cent, an impressive figure by any standards, although there could be long delays, which reduce the value of the settlement itself. Consumer grievance redressal is also an important regulatory function. Some countries such as Singapore have a system of industry body that oversees grievance redressal. This system offers a first and quicker choice of settling out of court. This system can serve the function of adjudication, arbitration, and conciliation.

Ensuring Solvency of Insurers

When the industry has a few firms there is some chance of collusion. The regulator must be alert to any collusive tendencies and make sure that prices charged remain reasonable. However, some cooperation among the insurance companies could be considered desirable. This is especially in lines where the claim experience of any one company is not sufficient to make accurate forecasts. Collusion among companies on information sharing and rate setting is considered 'fair'.

Ensuring the solvency of insurers is a very important function of a regulatory authority. In competing for the lowest premiums, insurance companies might charge prices which are too low. Resultantly, if contingency funds of an insurer are not adequate to pay out against claims, it can lead to bankruptcy. This is a lose–lose situation for insurer and consumer. Furthermore, due to the long tail nature of some of the claims, it may take long before the full claim liability becomes known to the insurer.

There are basically four ways of ensuring solvency.[7] First is the policy of a price floor. Second is the restriction on capital and reserves, i.e. on what kind of investments and speculative activities firms can undertake. Third is putting in place entry barriers to restrict the number of competitors. Fourth is the creation of an industry financed guarantee fund to bail out firms hit by unexpectedly high liabilities.

Insolvency can also arise out of reinsurers leaving insurance companies in the lurch, as witnessed in the USA in the 1980s. Reinsurance is a bigger business dominated by large international reinsurers. Such litigation between reinsurer and insurance companies involves cross boundary legalities and can drag on for years. The regulator must evolve a set of operational guidelines to deal with reinsurance matters.

Promoting Growth

Growth of insurance business entails better education and protection to consumers, and creating better incentives for commission agents and intermediaries.

The IRA can also consider allowing banks to act as agents (as opposed to underwriters) of insurers in mass base types of products. Given their wide network of branches and their customer base, the banks can access this market for insurance products and also earn commission income. The incremental cost of providing such insurance products would be much lower.

Insurance intermediaries such as agents, brokers, consultants, and surveyors are also subject to regulation. The IRA has to evolve guidelines on the entry and functioning of such intermediaries. Licensing of agents and brokers should be required to check their indulging in activities such as twisting, rebating, fraudulent practices, and misappropriation of funds.

THE CURRENT INSURANCE SCENARIO

A Brief Historical Detour

Life insurance activity in its modern form started in India in 1818 to provide for English widows. The first *Indian* life insurance company, the Bombay Mutual Life Assurance Society, started business in 1870. This was the first company that charged the same premium on both Indian and non-Indian lives. Earlier, native Indian lives were considered more risky and hence were charged a higher premium for coverage. Foreign insurance companies dominated insurance business in India and enjoyed near monopoly right up to the end of the nineteenth century. There was a close association between the nationalist movement in India and the development of Indian insurance companies. There was rapid growth of life insurance in India during the 1920s and early 1930s.

Insurance regulation formally began in India through the passing of two acts, the Life Insurance Companies Act of 1912 and the Provident Fund Act of 1912. However, the first comprehensive legislation was introduced with the Insurance Act of 1938 that provided strict state control over insurance business in the country. This provided an effective check on large-scale frauds that sullied insurance business during the 1930s.

After Independence, the business of Indian insurance grew at a faster pace as competition amongst the Indian companies intensified and as the non-Indian insurers were dislodged by Indian life companies. Despite the strides by the Indian companies, insurance business remained an urban phenomenon. There was immense scope for further spread of life insurance in the country. Moreover, this limited development was marked by many malpractices involving misuse of insurance funds, excessive costs, deficiencies, and frequent liquidation of insurance companies. This shook public confidence and also deprived policy holders of their savings and security.

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[7] The 'tail' in insurance jargon is the length of time it takes before insurers have to pay losses arising from policies that they have sold; losses on long-tail policies can take years to appear.

The LIC came into being in a principally urban insurance scenario, and one marred by insolvencies and increasing public distrust. The LIC was formed in 1956, when the Government of India brought together over 240 odd private life insurers and provident societies under one nationalized monopoly corporation. Another justification for nationalization was to raise the much needed funds for rapid industrialization and self-reliance in heavy industries, especially since the country had chosen the path of state planning for development. The LIC's stated aim was conducting the business in the spirit of trusteeship. This emphasis on trusteeship was relevant then, in light of major insolvencies and fraudulent practices of some private insurance companies prior to 1956. Life insurance in India has also been sold, albeit on a much smaller scale, since the late nineteenth- century through the post office network.

Similarly, prior to 1973, general (non-life) insurance business was provided by private companies. They restricted their operations mainly to organized trade and industry in large cities. Nationalization of general insurance business in India saw the amalgamation of 107 companies, including the branches of foreign companies. These were merged into four companies, viz. the National Insurance Company Ltd., the New India Assurance Company Ltd., the Oriental Insurance Company Ltd., and the United India Insurance Company Ltd. The General Insurance Corporation (GIC) was formed as a separate company in 1972.

Life Insurance[8]

The LIC is a state monopoly whereas the government-owned GIC has four competing subsidiaries. Box 1 provides some of the schemes offered by the LIC and the four subsidiaries of the GIC. Table 15.3 provides a snapshot of the growth of the LIC from 1956 when it came into being till 1997.

TABLE 15.3

Growth of Life Insurance

	1956–7	1997–8
Policy holders (million)	5.60	85.00
Income from premium (billion)	0.88	192.50
Investible funds (billion)	4.10	1058.30
Employees (million)	NA	1.26
Active agents (million)	NA	5.58
Number of branches	240.00	2046.00
Rate of return on investments (%)	4.52	12.30

Source: LIC Annual Reports.

Total premium income of the LIC has grown at a compound annual rate of 19.6 per cent between 1990–1 and 1996–7. Total premium income and the life fund as a per cent of GDP have risen to 1.42 and 7.64

Box 1

Insurance Products

An insurance 'product' refers to the contract between insurer and insuree. The contract features include premium payment and its time schedule, the sum assured, the contingencies that the contract covers, the exclusions, and so on. The following are some of the products sold by the LIC and companies under the GIC.

Life Insurance Products

(a) Basic Life Insurance Plans (whole life and endowment policy) (b) Term Assurance Plans (two years, convertible two years, Bima Kiran, Bima Sandesh) (c) Plans for Children (d) Pension Plans (survival annuity-cum-pension) (e) Jeevan Sarita (f) Special plans to meet special needs (Jeevan Griha, Jeevan Suraksha, Jeevan Sanchay, Asha Deep, Jeevan Mitra, Jeevan Sneha, Jeevan Saathi, etc.)

General Insurance Products

Tariff Products

(a) Fire Insurance (b) Motor Vehicles (c) Marine, Cargo, and Hull (d) Personal Accident (Individual and Group) (e) Engineering Insurance (f) Workmen Compensation (g) Bankers' Indemnity

Non-tariff products

(a) Burglary and Housebreaking (b) All risk (Jewellery and Valuables) (c) Mediclaim (d) Overseas Mediclaim (e) Bhavishya Arogya (old age mediclaim).

Source: LIC and GIC Annual Reports, LIC website:http://www.LICindia.com respectively in March 1997. Demand for policies with higher sum assured has been increasing. Whether this demand is driven by the need for higher risk coverage or whether it is simply a response to the special tax shelter is debatable.[9] This is corroborated by the fact that around 33 per cent of new policies are taken up in the month of March—the last month of the financial year—while less than 1 per cent are taken up in the following month, April. This *March phenomenon* reflects that life insurance needs to be sold innovatively and vigorously and without any tax props, all of which greater competition is likely to foster.

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[8] The material in this subsection is drawn from Ranade and Ahuja (1999).

A regional analysis of the spread of life insurance suggests strong correlation between per capita premium paid and per capita zonal income (zonal domestic product) confirming a worldwide trend of increased insurance penetration following increases in incomes. Also, insurance density shows strong correlation with social indicators such as region-wise literacy levels (see also Outreville, 1994).

General Insurance

General (non-life) insurance has basically three lines of business, viz. motor vehicles, marine and cargo, and fire, although there are more than 140 different products. Health insurance marketed as Mediclaim is a relatively recent product. General insurance policies cover a wide range of property and liabilities from cattle worth a few thousand rupees to industrial locations (with a comprehensive insurance) worth more than 50 billion. However, more than half the gross direct premiums collected come from insuring industry, rather than personal and small businesses. Mediclaim and other personal indemnity and liability products offer a major growth potential. It is worth noting that in the case of the USA, more than 55 per cent of all non-life premiums come from just two mandatory lines, viz. third party automobile insurance for auto-owners, and workers' compensation (for work accidents) for all employers. These two lines plus medical malpractice and product and personal liability insurance had accounted for more than 125 per cent of premium collection in 1989 (see Grace and Barth, 1989). As with personal and commercial lines of business, a further classification of non-life insurance is along long-tailed and short-tailed, depending on the payout profile. If the payout drags on for several years due to litigation, insurers cannot make accurate or adequate provision for losses and settlements. The long-tailed lines of insurance that involve long delays in settlement are exposed to inflation risk and might be subject to market driven cycles. This phenomenon is particularly acute in the USA.

In India too the claims experience of the GIC has shown an upward trend, rising from 43.8 per cent in 1973 to 75.8 per cent in 1996–7 (see Table 15.4). This was attributed to increasing court awards and absence of structured compensation for third party claims. In fact due to irrational pricing and third party claims, in the motor vehicles business the GIC companies lost more than Rs 15 billion over a three-year period up to 1997. The GIC has also experienced bunching of increased expense liability in its own operation due to a combination of wage revisions, pension schemes, and leave encashment. The expense ratio of the GIC was about 24 per cent in 1997.

TABLE 15.4
General Insurance
Some Indicators

(Rupees billion)

	1973	1980	1990	1997
Gross premium	2.04	5.03	22.79	73.48
Net premium	1.84	4.81	21.86	67.34
Profit before taxes	0.38	0.92	4.81	10.84
Profit after taxes	0.14	0.43	3.34	7.19
Investments	3.45	—	—	145.00
Yield on mean value (%)	6.5	—	—	12.7
Employees		40,748	80,192	85,274
Offices		1272	4025	4220

Source: Presentation at International Conference on Insurance, New Delhi, August 1998, and Confederation of Indian Industry (1998).

Reinsurance is a big part of non-life insurance business. Subsidiaries of the GIC are required to reinsure 20 per cent of their business with the GIC. However, the industry's outward and inward reinsurance operations are not very significant, reflecting a cautious approach despite the fact that the GIC has the potential of emerging as one of the major reinsurers in the Asian market.

BENCHMARKS FROM ABROAD

Insurance density, defined as premium per capita, is one of the commonly used statistics for comparing the spread of insurance across countries. Such a measure is not appropriate for several reasons. Briefly these are:

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[9] According to Section 88, the amount of income tax payable on total taxable income is reduced by 20 per cent (25 per cent in case of author, playwright, etc.) of the aggregate amount paid towards insurance, pension fund, provident fund, etc. subject to the maximum of Rs 70,000 in case of an individual and Hindu Undivided Family as well as in case of authors, playwrights, etc. Therefore, the maximum amount of rebate in income tax payable will be Rs 14,000 or Rs 17,500 respectively.

a. Different countries have vastly different aggregate incomes; thus to the extent that life insurance is a normal good, its demand is likely to be higher in more affluent countries.

b. The distribution of income varies substantially across countries; thus even controlling for aggregate income, a country with a more skewed distribution is likely to have lower per capita demand for insurance.

c. Tax treatment of insurance, and hence incentives to buy life insurance, differ markedly across countries.

d. The degree of development of alternative financial markets and instruments may be different across countries; for example, the *Economist* (1997) cites that in South Africa since bank deposits earn a negative real rate of return, the assets of insurance companies as a fraction of GDP are second highest in the world, next only to Japan.

Given this, comparisons across countries are only indicative. Penetration of insurance in various countries is given in Table 15.5.

TABLE 15.5

International Comparison of Insurance Penetration: Premium/GDP

(per cent)

Africa		Asia		Latin America		North America	
S. Africa	12.8	China	1	Brazil	4.3	USA	8.83
Zimbabwe	4.8	S. Korea	12.3	Panama	3.3	Canada	6.97
Kenya	2.4	Japan	8.6	Chile	3		
Morocco	2.1	Taiwan	4.8	Colombia	1.8		
Tunisia	1.7	Malaysia	3.8	Argentina	1.6		
		Singapore	3.7	Mexico	1.5		
		Philippines	2.3	Venezuela	2.2		
		Thailand	2	Uruguay	2		
		India	1.7				

Source: Sigma, World Insurance in 1992, Swiss Reinsurance Company, 3/94.

Less than 7 per cent of Indian population has life insurance cover. In Singapore, around 45 per cent of the people are covered and in Japan the figure is close to 100 per cent. In the US over 81 per cent of households have insurance cover . India has the biggest life insurance sector in the world if we go by the number of policies sold, but the number of policies sold per 100 persons is very low. However, this observation has to be qualified by noting that insurance is typically spread very thinly among rural agricultural population, which constitutes a negligible proportion in the developed countries, whereas it is almost 67 per cent of India's population.

But total life premiums collected per annum were only 1.4 per cent of GDP in 1996–7. This measures market penetration of insurance within any country. In Singapore this figure was about 2.3 per cent in 1995, for Japan it was 6.3 per cent, and for South Korea the rate was about 9.8 per cent. Since Indian insurance collection is a tiny share in the world life insurance premium collection, and it is a small proportion of India's GDP, it means that the average premium collected per policy is very low. The market share of world life insurance premiums is topped by Japan (30 per cent), followed by the USA and then the UK. The share of all developing countries is a meagre 2.5 per cent. Similarly, the amount of premium collected per capita too is very small compared to developed countries or even some of the fast growing developing countries (see Table 15.5).

The major insurance markets in South and East Asia are to varying degrees open. These range from the comparatively free markets of Hong Kong and Singapore to the increasingly more liberal markets of South Korea and Taiwan and more densely regulated insurance sectors of Thailand and Malaysia. Opening up of the insurance sector is an integral part of the liberalization process being pursued by many developing countries. Since 1987, when the Korean and Taiwanese insurance sectors were liberalized, the Korean market has grown three times faster than GDP and in Taiwan the rate of growth has been almost four times that of its GDP. The Philippines opened up its insurance sector in 1992.

KEY EMERGING AREAS

Demography and Demand for Pension Plans

Two relatively modern trends in the Indian context affect life insurance business significantly. One is the break up of the joint family system, which worked like an insurance arrangement. With more and more nuclear families becoming the rule, there is greater demand for life insurance cover for the breadwinner of the family. The second trend, also connected with the first one, is that the elderly are increasingly having to fend for themselves. In 1990 India had about 54 million people above the age of 60. This number is expected to rise to 71 million by 2000, and to almost 10 per cent of the total population by 2010. Thus future senior citizens look on plan for their own old age, rather than be a burden on their children. There is greater awareness of planning for old age, and the need for pensions and annuities. These two trends portend a large and growing market for life insurance in India. Some other factors which are catalysing these developments are the increase in the size of India's middle class, rising per capita incomes, and rising literacy. With an estimated size of 250 million, the middle class is at least four times as large as the current coverage of LIC. Other developments are an above 6 per cent growth rate of the economy which translates into higher savings, and a proliferation of savings instruments, an economically liberalized atmosphere, and greater consumer awareness and level of education about insurance.

In much of the developed world, pension funds represent an important form of financial assets in the economy. For example in the US economy in 1992, pensions accounted for 36 per cent of all financial assets, behind banks with 46 per cent. There are important conceptual issues surrounding the provision, funding, and management of pension funds, which we do not discuss in this chapter. For example, it is now recognized that the state cannot be sole provider of old age income, nor is it advisable to leave pensions completely in the private arena. In India, however, except for the organized sector employees, for much of the labour force, including the self-employed, there is hardly any social security in the form of old age pension. Out of an estimated 340 million people in the labour force, less than 30 million are covered by any old age income security, including pensions (for mainly central government employees), employees' provident fund and public provident fund. The biggest single group of persons not covered by any old age income security is agricultural labour.

Separateness of Insurance and Banking

There have been longstanding barriers between various sets of players within the financial markets. However, with growth in computing and communication technology, the distinction between banking, securities, and insurance firms is blurring. For example, banks now offer long-term investment opportunities, and mutual funds would soon allow the customer to write cheques. With this in mind, there is some speculation whether banks should be allowed to operate in the insurance sector. Banks are already in the business of credit enhancement, underwriting loans, and providing credit-related assurances. To that extent their activites include some insurance aspects.

But there are several reasons for and against allowing banks in insurance.[10] Briefly the benefits are (a) competition would enhance efficiency and benefit customers, (b) banks could recoup some of the lost business to securities firms, (c) bank profitatbilty could be enhanced thus ensuring their financial soundness, (d) the public can enjoy a 'one-stop financial services' paradigm, if banks are allowed to sell insurance and securities, and (e) there would be synergies in operating insurance and banking. The reasons against allowing banks to enter insurance are (a) it would create unhealthy concentration of market power, (b) banks would have unfair advantage since they have detailed information on their customers' financial position, (c) banks also have unfair advantage in the sense that depositor accounts are automatically insured by the government, and finally (d) it would expose banks to additional and unnecessary risks. This debate is, however, far from settled, and we are likely to see some restructuring in operations of banking and insurance.

Role of Information Technology and Postal Network

The business of selling life insurance requires assessing the profile of the customer and assigning the right policy. This process is facilitated by a database and data warehousing that is created in the course of a corporation's operations. Thus this business is completely driven by information technology, which can result in substantial productivity gains. With its huge network, the LIC has a tremendous incumbency advantage in being able to generate such a database. The LIC is a unique organization involved in the selling of essentially one product on a massive scale. If it uses this network to offer other financial products such as pension plans, other long- and short-term savings instruments, various term insurance products, it would have better utilized this vastly underutilized capacity.

Another key development likely to spur the spread of insurance is allowing the existing network of 150,000 branch offices of the Post and Telegraph to sell life insurance and related financial products. Already postal banks generate more deposits than all commercial banks put together and hence their role can hardly be overemphasized. Banks or post offices can also act as avenues or agents of non-life insurance companies. However, they cannot be expected to underwrite risks.

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[10] See Wright (1992) for details.

THE POLITICAL ECONOMY OF INSURANCE REFORMS

The 1998 winter session of India's Parliament witnessed lawmakers grappling with the issue of whether to allow private and foreign companies into India's Rs 400 billion insurance sector. Opening up the insurance sector requires crossing at least two legislative hurdles. These are the passage of the Insurance Regulatory Authority (IRA) Bill which will make the IRA a statutory regulatory body, and amending the LIC and GIC Acts, which will end their respective monopolies.

The insurance unions and their left-wing (CPI) and right wing (SJM) allies are vehemently opposed to any move to open up insurance. Insurance privatization has been doomed to be a see-saw. The Congress party initiated it by forming the Insurance Reforms Committee in 1993, the UF government tried to introduce legislation in 1996, only to be thwarted by the then opposition Congress and BJP, and the BJP is finding it rough going now.

Justifying the need to allow private entry in the insurance business is like being guilty until proven innocent. One should rather ask why insurance should be a government monopoly. There was a time when nationalizing insurance business made sense. But that was forty years ago. The milieu has changed. Information technology, faster communication, much greater consumer awareness, a burgeoning middle class and an ageing pensionless class, and finally better regulatory mechanisms have substantially altered the playing field. Also it is not the LIC or the GIC that is being privatized. Furthermore, private entry is not the same as foreign entry. In principle the former is possible without the latter.

The insurance employees' union is offering stiff resistance to any private entry. This is in contrast to bank and telecom unions who were less upset about private entry in their respective sectors. In fact if airlines, telecom, banking, power, and even postal services (courier) can have private players, why must insurance remain a state monopoly? So what are the unions' objections to private entry in insurance? While there are several points raised by the unions, three objections seem to be the most important. These are (a) that there is no major untapped potential in insurance business in India; (b) that there would be massive retrenchment and job losses due to computerization and modernization; and (c) that private and foreign firms would indulge in reckless profiteering and skim the 'urban cream' market, and ignore the rural areas. Considering that only about 65 million out of a potential of 250 million people are covered by life insurance, and there is complete absence of personal insurance, products such as pensions, health insurance and the like, the 'no untapped potential' argment cannot be accepted. It is, however, true that tapping the vast rural and mostly agricultural sector for insurance will require radically different and innovative marketing approach. The fear of job losses is also unfounded as can be gauged by the experience of insurance liberalization in South Korea, the Philipines, and other countries. If anything employment and job creation (through a system of agents) rose several fold. And finally the fear of skimming urban markets is best tackled by regulatory requirements as in airlines and telecom deregulation. This is no reason to hold up private entry into insurance.

The real story behind the protests of the unions is that the dismantling of government monopoly would provide a benchmark to evaluate the government's insurance services. In the absence of competition, customers simply do not have other options. Through private entry, the LIC/GIC would be forced to continuously upgrade service quality, product variety, premium rates, and grievance redressal mechanisms to keep up with the competition. In fact, the recent spate of advertisements (now not just on DD but on private channels as well), and several new products, show that both the LIC and GIC companies are on their toes already. With deep pockets, massive investible fund, a wide and well-established network the LIC and GIC do not have to worry about surviving. They, however, have to shape up and increase productivity, which calls for greater effort from employees.

CONCLUDING COMMENTS

Insurance is a Rs 400 billion business in India, and yet its spread in the country is relatively thin and shallow. There is tremendous potential for growth, and tapping this growth potential calls for reforms. The insurance reforms committee called for allowing private entry into insurance, setting up a strong regulatory authority and ensuring financial soundness of all the players. Successive governments in the past few years have been unable to implement the recommendations of the reforms committee, despite insurance general consensus on their desirability.

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16

Risk and the Indian Economy

Susan Thomas and Ajay Shah*

In recent years, India's economy has experienced liberalization of many markets. Liberalization has helped convert the steady stream of change in the real economy into a steady stream of price changes. This has yielded an altered environment of price volatility in the economy. In this new environment, we need to understand risk better, in order to measure it, and to create new kinds of financial markets which allow risk reduction through hedging.

RISK AND ECONOMIC LIBERALIZATION

Every economy in the world experiences change. Technological change, the changing tastes of individuals, changes in institutions, law, economic policy, and regulations all impact upon resource allocation in the economy. Changes outside a country have an impact through trade and capital account interactions. These changes generate a variety of risks for all individuals and firms. Here 'risk' is defined as exposure to an uncertain event.

Risk in the Controlled Economy

When change takes place, in the normal functioning of a market, prices move to equate supply and demand; markets ration goods using the device of prices. State-dominated economies often place hurdles against price adjustment. In a policy regime which emphasizes the role of the government in influencing resource allocation, the stress of change manifests itself through a set of symptoms: shortages or gluts in certain markets and large profits or losses of both public and private firms.

So when faced with change, an interventionist state could react in several ways. Shortages could be addressed by rationing and price controls. These generally inspire an underground economy which uses price-based rationing. Losses of firms could temporarily be handled by nationalization (in the case of private firms) or capital infusions (in the case of public sector firms). In either case, these amount to a transfer from taxpayers. Sometimes, these adaptations prove inadequate or infeasible, upon which the state chooses to adjust prices. This generates large, sudden movements in the price in response to the pent-up accumulated changes.

The choices made by the state are the outcomes of a political process. In practice, incomplete information and imperfect information processing by the government, coupled with the frailties of the political process, often produce late and imperfect reactions to the stress of change.

Example: A Controlled Currency

State-dominated currencies exemplify the process through which the economy responds to change in a market where the state influences prices.

- When conditions in the home country (or outside it) change, a fixed exchange rate generates a current account surplus or a deficit. The exchange rate should change in order to restore equilibrium.
- In practice, the imperfect information and imperfect information processing by the government often slows down the diagnosis. One extreme version of this 'imperfect information processing' is the emotional pride which is sometimes associated with a 'strong' currency.
- Government actions are inevitably the subject of political lobbying. Exporters initiate political actions to

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* Chapters 16 and 17 should be read as twin chapters with common references at the end of the Chapter 17.

favour devaluation of the rupee while importers initiate political actions to favour its appreciation. These pressures are fairly symmetric.

Many countries, like India, have begun moving towards capital account convertibility in terms of allowing capital to come into the country, while preventing outward capital flows. Hence there are one-sided political pressures from importers of capital who favour appreciation of the currency, without the counterbalance of local investors who have diversified internationally and would favour a depreciation.

- In recent decades, the controlled dollar–rupee exchange rate has seen large, sudden changes from time to time (see Figure 16.1). Each of these large changes was a significant shock for the economy.

Risk Management in the Controlled Eeconomy

What would 'risk measurement' and 'risk management' in the controlled economy entail?

1. *Risk measurement:* In the controlled economy, risk is extremely hard to numerically measure using public data. If cement prices are controlled, then cement prices exhibit no volatility; yet the cement market poses significant risks to consumers and producers.
2. *Risk management:* The most important tool of risk management, in the controlled economy, was human links into government. If a firm used steel as raw material, and there was a shortage of steel, then human relations with the government could help the firm lay a claim upon scarce steel. If a firm produced steel, and there was a drop in the price of imported steel, then human relations with the government could help the firm block imports of steel. These tools of risk management, however, worked unpredictably at best, given the zero-sum nature of the political contest for influence upon government policy; for each firm which successfully exercised its options, other firms would find that their investments into risk management failed to work as planned.

In summary, this was a climate in which risk was hard to measure, and tools for reliable risk management did not exist. Risk-aversion led Indian firms to invest sizable resources into risk management—of the fashion described above.

Risk in the Market Economy

The liberalization process is primarily about using markets to solve problems of resource allocation. In the market economy, *prices* (rather than government actions) are in the frontline of the reaction to change. When onions become scarce, and a market for onions exists, onion prices immediately rise, without requiring a political decision to raise prices.

If onion prices were fixed by government, then *information* about supply and demand would not be available, except through observing the black market price of onions. With markets, the price of onions is publicly visible, and it inspires supply and demand responses. With price controls, the price is fixed but availability is variable; conversely, when price controls are lifted, the availability is fixed but the price is variable.

When we make a transition from an economy with fixed price of onions to one with market-determined price, there is a qualitative change in the character of risk. With controlled prices, (a) the risk is not normally visible in price volatility, and (b) the price time series is characterized by long periods of constant prices punctuated by sudden, large price movements. When price controls are lifted, the illusion of low risk that goes with fixed prices is absent, the risk is manifested *daily* as a constant price volatility, and the infrequent large movements do not take place.

Risk Management in the Aftermath of Liberalization

Once price controls are lifted, a regime with steady price volatility comes about. This is often unpopular, for reasons of unfamiliarity, and because existing techniques of risk management are unable to cope with it. Price volatility generates political pressures through traditional channels of lobbying to try to help a loss-making firm, and typically helps generate a constituency that opposes reforms.

However, price volatility should not be viewed as an unpleasant side effect of liberalization; the movement of prices is the central response to change in a market economy. Change is inevitable, and hence risk is unavoidable. Risk-averse individuals would seek risk management strategies when exposed to risk. The problems of this transition will be minimized to the extent that new tools for risk management come up in the economy, and those tools are widely accessible at a low cost to all affected by risk. This chapter is about understanding risk, measuring risk, and the new tools for risk management which are coming in India.

RISK MEASUREMENT

An economic agent is said to have an *exposure* to a certain price if he stands to gain or lose from price movements. Exposures can derive from a variety of subtle relationships. The simplest exposure is like that of an exporter, who stands to directly lose from a currency appreciation. But once this firm is at risk, the risk goes beyond its shareholders to affect employees, suppliers, competitors, etc. If firms *A* and *B* are competitors, and *A* uses imported raw materials while *B* does not, then *both A* and *B* have currency exposure—a currency fluctuation which hurts *A* benefits *B*, and vice versa. A complete enumeration of exposures would be as complex as the full array of complex interlinkages in the modern economy.

In recent decades, the quantification of risk has been a central theme in the development of financial economics. One of the most useful ways in which risk is expressed is by using 'value at risk' (VaR).

VaR

In the area of risk measurement, VaR is the most easily comprehended risk measure (Jorion, 1997). For every portfolio, over a given time horizon, there is a probability distribution of profits or losses. The 'VaR at a 99 per cent level for a horizon of one day' is loss in a single day—measured in rupees—which will only be exceeded on 1 per cent of the days.

Suppose a portfolio has a VaR at a 99 per cent level on a one-day horizon, of Rs 10,000. This means that the one-day loss on this portfolio will exceed Rs 10,000 on 1 per cent of the days. Since there are 250 trading days in the year, this means that the worst two-three days in the year will feature losses greater than Rs 10,000. Box 1 shows a few examples of VaR applied to typical portfolios on India's equity market.

VaR is a concept which is applied to a *portfolio*, not an instrument. The mathematics of portfolio theory implies that it is not possible to calculate the VaR of a portfolio formed of securities *x* and *y* merely by using the VaR of the securities individually. VaR should be applied after aggregating all positions (in spot or derivative markets), giving one single risk measure. This is in sharp contrast to traditional approaches towards risk which use a 'building block' approach to add up the risk of individual components to form an assessment of total risk: this is analytically incorrect, in the light of modern portfolio theory. The risk of a portfolio is not the weighted average of the risk of its components.

Once an economic agent develops an awareness of her exposure, she could embark on a hedging strategy to reduce this risk. The gains from hedging would be

Box 1

VaR on India's Equity Market: Some Examples

The numerical values shown here are based on a VaR system covering the hundred most liquid stocks in India, created at the the IGIDR. We will use VaR to illustrate the concept of *diversification*. At the simplest, single-stock portfolios are highly risky:

Portfolio 1:	TISCO	1,000,000
VaR		62,253
Portfolio 2:	State Bank	1,000,000
VaR		60,773

This tells us that the 99 per cent VaR on a one-day horizon on a million rupee position on TISCO is Rs 62,253; i.e. the worst two-three days in a year on such a position would have losses exceeding Rs 62,253 in one day. Portfolio diversification reduces risk:

Portfolio 3:	TISCO	500,000
	State Bank	500,000
VaR		55,934
Portfolio 4:	TISCO	200,000
	State Bank	200,000
	Larsen & Toubro	200,000
	ACC	200,000
	ITC	200,000
VaR		50,963

This illustrates the gains from diversification. The two stock portfolio (worth Rs 1 million) has a lower VaR by Rs 5000 or so. The five-stock portfolio (worth Rs 1 million) has a lower VaR by Rs 10,000 or so.

When we carry diversification much further—to hold the fifty stock portfolio of the NSE-50 index—the 99 per cent VaR on a one-day horizon drops to around Rs 39,350. This is much smaller than the risk associated with individual stocks or underdiversified portfolios.

quantified through the reduction in VaR. For example, in Box 5, we apply stock index futures to hedge the portfolios shown in Box 1; this yields a striking reduction in risk as measured by VaR.

VaR started out as a framework to address 'market risk', the risk that derives from price fluctuations. It is additionally possible to incorporate the losses that may derive from liquidity risk and credit risk into concepts akin to VaR. These enhancements significantly expand the domain of application of VaR. However, when it comes to the non-economic risks that derive from computer crime, rogue traders, and the breakdown of internal controls, VaR is of little use. Here, the tools of auditors and policemen are better suited than the tools of economists.

Box 2

Estimating VaR

In mathematical terms, if the profit/loss (measured in rupees) on a portfolio is a random variable x with a probability distribution $f(x)$, the VaR υ at a 99 per cent level is obtained by solving the equation $\int^{\upsilon}_{-\infty} f(x)dx = 0.01$. In this enterprise, two major distinctions hold: (1) the distinction between models which rely on normal distributions versus more general models, and (2) the distinction between 'linear assets', i.e. spot and futures, as compared to 'non-linear assets', i.e. options and other complex derivatives.

The simplest point of departure is a situation where (a) a portfolio contains only linear assets and (b) the normal distribution is assumed. In this case, VaR calculations are straightforward, as long as forecasts of future volatility are available (third section). If a portfolio ω of assets with a covariance matrix Σ is held then the portfolio returns are also normally distributed, with a standard deviation of $\sqrt{\omega'\Sigma\omega}$. Using probability tables for the normal distribution, and this standard deviation, we can obtain the VaR. For example, the 97.5 per cent VaR is a loss of 1.96 σ.

In the real world, there is evidence to suggest that asset returns are significantly non-normal. Extreme values tend to occur more often than they would under the normal distribution; this is called 'the problem of fat tails'. The second assumption is violated for all portfolios which contain options.

These aspects make the estimation of VaR more demanding. With fat tails, the 97.5 per cent VaR will be a loss greater than 1.96 σ. With options or non-normal assets, the simple formulation, $\omega'\Sigma\omega$, is inapplicable. Even under these conditions, VaR as a concept remains analytically sound. This is unlike the portfolio standard deviation, which has limited value in a world with options and non-normal distributions. However, a greater complexity of models and information processing is required.

We can identify two distinct strands of work in building VaR systems. On the one hand, there are applied mathematicians working on handling non-linear assets such as options. On the other hand, there is applied econometrics going into building models of asset prices which accurately depict the joint distribution of the underlying assets. Building a good VaR system is about harnessing good ideas in these two areas.

A supplement to VaR systems based on such models is the idea of 'stress testing'. Abroad, five common stress scenarios which are used in probing the vulnerabilities of portfolios are (a) the October 1987 stock market crash, (b) the 1992 exchange rate mechanism crisis, (c) the March 1994 bond market sell-off, (d) the December 1994 peso crisis, and (e) a hypothetical flight-to-quality scenario. The losses that a portfolio would suffer under each of these extreme scenarios are used, alongside the VaR, as a measure of exposure. In India, stress testing could use three interesting scenarios (a) the scam of 1992, (b) the interest rate hike of 16 January 1998, and (c) the aftermath of Pokhran-II in middle 1998.

The Risk in VaR

How is VaR calculated? Box 2 highlights the issues faced in VaR estimation, and the third section is about forecasting volatility, an essential input in VaR estimation. To a good extent, these are research problems as of today; off-the-shelf tools and techniques do not exist which can yield a well-functioning VaR system that suits any portfolio. This is an area of active research and development.

While even the most primitive VaR system does yield useful information as compared to having no risk measurement, it is dangerous to ignore 'model risk'. The decimal places seen in VaR estimates (e.g. Box 1) are an illusion: it is dangerous to treat any VaR estimate obtained in the real world as a hard number instead of what it really is—an inherently imprecise statistical estimate.[1]

The Value of VaR

Given a black box which can consume portfolios and show accurate VaR estimates, the usefulness of VaR lies in ease of interpretation and application (Shah, 1998c).

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[1] VaR estimates are, in the final analysis, the products of econometric models based on historical financial price data. There are simple methods through which the quality of a VaR system can be monitored on an ongoing basis (Shah, 1998c). These are a powerful check in preventing egregious errors, provide a sense of model accuracy, and can help guide efforts in model development and refinement.

Most finance companies and regulators are presently not equipped with a serious knowledge of financial economics. Yet VaR numbers present them with decisions about risk which they *are* equipped to make intuitively. For example, a bank might find itself thinking 'We stand to lose Rs 4 billion on the two–three worst days of the year—is this a level of risk that we are comfortable with?' If this question is answered in the negative, then the bank could either initiate hedging strategies, or scale down its positions, until the VaR obtained is compatible with the risk tolerance of the managers.

A central notion in the problem of capital adequacy is controlling the probability of bankruptcy. The natural comparison here is between shareholders, capital and the loss over a stated horizon. Shareholders, and regulators, would find it natural to instruct managers using statements of the form *'The VaR over a month at a 99.99 per cent level should not exceed the equity capital of the firm.'*

In summary, the contribution of VaR is that of *offering a way to bring full-fledged portfolio analysis to bear upon the operational functioning of modern financial markets*. This is a major advance as compared to the primitive notions of risk generally used by financial market practitioners and regulators in previous years.[2] The weakness of VaR lies in the fact that users of VaR tend to ignore the necessarily imperfect models of reality that lurk inside every VaR system, and the statistical imprecision of all numbers which come out of it.

RISK IN THREE MAJOR FINANCIAL MARKETS

The early finance literature worked on the assumption that the returns standard deviation (σ) was constant through time. Empirical analysis has shown that price volatility varies across time. There are times when the range through which prices fluctuate is larger than that seen at other times. In addition, financial markets seem to exhibit 'volatility clustering' where low volatility days tend to be followed by low volatility days, and vice versa. For instance, in the days following Pokhran-II, financial markets in India had elevated volatility for many consecutive days.

When σ fluctuates through time, the term *heteroskedastic* (changing variance) is applied instead of *homoskedastic* (constant variance). These changes raise the question of whether σ can be forecasted. If good forecasts can be obtained, they would yield improved VaR estimates as compared to simple procedures which assume a constant σ.

Is Volatility in Indian Markets Constant?

Table 16.1 shows how the σ of daily returns changes across different years, for three Indian markets: the stock market, foreign exchange rate, and the call money market. It suggests that in all three cases, homoscedasticity does not appear to hold.

TABLE 16.1
Volatility of Daily Returns, by Year
(σ of daily returns [%])

Year	Equity	\$-Rupee	Call money
1990	3.053	0.212	—
1991	1.716	1.090	—
1992	3.322	0.866	—
1993	1.745	0.356	—
1994	1.407	0.099	—
1995	1.240	0.568	—
1996	1.527	0.531	2.431
1997	1.745	0.315	2.284
1998	1.872	0.472	5.937

Note: This table shows the volatility of daily returns on three major markets—equities (the NSE-50 index), currency, and interest rates (on the call money market). For each series, the σ of daily returns is reported in each calendar year. For example, the σ of daily returns on Nifty ranges from 1.24 in 1995 to 3.32 in 1992. This suggests that the σ is not constant through time.

Is Volatility Clustering Present?

Normally, financial prices exhibit little forecastability. Consecutive price changes are fairly uncorrelated; if the price went up today it tells us little about whether the price will go up tomorrow. In contrast, *volatility* does seem to be forecastable.

This is seen in Table 16.2, which documents the autocorrelations of squared-returns for the three time series. In the case of all three series, several autocorrelations are statistically significant, which suggests that opportunities for forecasting do exist.

In understanding the VaR of portfolios, it is not only the standard deviations which need to be forecasted; forecasts of correlation coefficients between the returns of various assets are also required. Empirical research suggests that similar patterns do exist in correlations also, and forecasting these correlations is as important to risk forecasting as thinking about future volatilities.

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[2] One exception—an approach towards risk measurement which is enshrined in traditionally regulatory practice and is intellectually defensible—is the way in which initial margin is calculated by futures clearing corporations, in systems such as SPAN or TIMS, which date back to the 1970s. Indeed Culp, Miller, and Neves (1998), describe the initial margin of the futures clearing corporation as a first attempt towards VaR.

TABLE 16.2
Evidence of Dependence in Volatility across Time

Lage (in days)	Autocorrelation coefficients of r^2 Equity	$-Rupee	Call Money
1	0.281*	−0.039	−0.503*
2	0.146*	0.178*	−0.035*
3	0.281*	0.019	0.091*
4	0.154*	−0.049*	−0.151*
5	0.178*	0.028	0.080*
6	0.181*	0.008	0.078*
7	0.179*	0.041	−0.005
8	0.125*	0.047*	−0.080*
9	0.143*	−0.013	−0.034
10	0.110*	0.024	0.080*

Note: This table shows the correlation between squared returns on the three markets. For example, the correlation coefficient between consecutive squared returns of Nifty is 0.28. The correlation between squared returns across two days is 0.146. All values marked with an asterisk are statistically significant.

Modelling Strategies

One pioneering effort in VaR estimation was made by J. P. Morgan in the early 1990s, which led to a system called 'Riskmetrics' (J. P. Morgan/Reuters, 1996).[3] Riskmetrics is based on simple time series forecasting of future standard deviations and correlation coefficients, based on recent returns. The appeal of Riskmetrics is that it is easily applied to large databases of time series data, to portfolios spanning thousands of financial instruments.

In recent years, models of the ARCH family (Bollerslev, Chou, and Kroner, 1992) have proved to be very useful in understanding and forecasting volatility. ARCH stands for 'autoregressive conditional heteroskedastic'. GARCH stands for 'generalized ARCH'. Box 3 describes the volatility process implied in these models.

Forecast Horizon

Risk measurement is often done using different horizons. On securities markets, the trading day is the natural horizon. In other situations, longer horizons are sometimes used.

One thumb-rule is sometimes useful. The σ over k trading days is roughly $\sqrt{k}$ times larger than the σ over a one-day horizon. If there are twenty-five trading days in a month, then monthly volatility would be roughly five times larger than one-day volatility. When VaR is done using normal distributions and linear assets (i.e. the portfolio contains no options), the same scaling factor of $\sqrt{k}$ works for VaR also: the VaR over a one-month horizon would be roughly five times larger than the VaR over a one-day horizon.

This thumb rule breaks down in many situations. In the context of volatility clustering and ARCH models, this rule is inaccurate. Monthly Nifty volatility turns out to be 10.8 per cent compared, instead of the 8.4 per cent we expect from applying the $\sqrt{T}$ rule to the volatility of daily returns. When portfolios contain options, the portfolio volatility (and VaR) does not scale up across time in this fashion.

The Equity Index

Constant Volatility Assumption

In the absence of explicit volatility models, the best estimate of VaR is based on the average standard deviation of daily returns on the index. For instance, the σ of daily returns on Nifty in 1998 was 1.87 per cent. Hence, 95 per cent of the days would observe index movements between −3.7 per cent and +3.7 per cent. Since the index is near 1000, this means that one-day movements larger than 37 points would be observed on 5 per cent of the days.

Box 3

Arch and Garch Models

ARCH models link present volatility to past squared returns. In addition, GARCH models also exploit information in the volatility from previous periods. This expresses the idea that financial markets seem to have 'volatility clustering', where periods of high volatility seem to be followed by periods of low volatility.

In mathematical terms, h_t, the volatility at time t, is expressed by:

$$\text{ARCH (1)}: h_t = \gamma_0 + \gamma_1 r_{t-1}^2$$

$$\text{GARCH (1, 1)}: h_t = \gamma_0 + \gamma_1 r_{t-1}^2 + \gamma_2 h_{t-1}$$

where r_{t-1} is the returns on the previous day, and h_{t-1} is volatility on the previous day. Such a model has 'autoregression in volatility', or the dependence of volatility today upon volatility in the past. The numbers γ_0, γ_1, and γ_2 are model parameters. They are estimated using historical data. As an example, for the NSE-50 index, the GARCH (1,1) model turns out to be:

$$h_t = 0.13 + 0.12\, r_{t-1}^2 + 0.85\, h_{t-1}$$

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[3] See http://www.riskmetrics.com.

The link between VaR and portfolio volatility is quite simple when portfolio returns are normally distributed. Losses worse than 1.96σ are observed 2.5 per cent of the time. Hence the 97.5 per cent VaR is close to 2σ. This means that for Rs 100 invested in Nifty, the 97.5 per cent VaR on a one-day horizon is Rs 3.7. This VaR estimate is a constant regardless of whether the market suffered a day of high or low volatility.

Applying Volatility Models

In comparison, we can use volatility estimates from the GARCH model shown in Box 3 to calculate the VaR on the same portfolio. Compared to the estimates of Table 16.3, the VaR obtained assuming a constant σ–Rs 3.7–proves to be an overestimate in Scenario I (when it is closer to Rs 2.5) and an underestimate on high volatility days (in Scenario II it is closer to Rs 5).

TABLE 16.3
VaR of Nifty
Two Scenarios

	Scenario	
	I	II
h_{t-1}	1	1
Nifty on $t-2$	950	950
Nifty on $t-1$	930	997
r_{t-1} (%)	-2.2	+5
$\sqrt{\hat{h}_t}$	1.25	2.5
97.5% VaR	2.5	5

Note: This table shows two scenarios. Both start from a state where Nifty volatility (h_{t-1}) is at 1. In each case, we seek to know the VaR at a 97.5 per cent level on a one-day horizon on a portfolio of Rs 100.

In Scenario I, Nifty drops from 950 to 930, a drop of 2.2 per cent. This generates a volatility forecast of 1.25 per cent using the model of Box 3, and a VaR of 2.5 per cent.

In Scenario II, in contrast, Nifty rises by 5 per cent. This enhanced volatility works through into a higher VaR of 5 per cent when the same model is applied.

In the case of monthly volatility, the dependence of volatility in one month on the next is not so strong. Instead, there are certain events that systematically move the volatility in certain months. One such event that affects volatility in the index monthly returns is the budget announcement every year (usually at the end of February). The Nifty volatility in the vicinity of the budget is found to be twice as high as the normal. Once this is taken into account, there is no volatility clustering in Nifty monthly returns.

International Integration

The integration of global markets is generating integration of risk across countries. This means that volatility spillovers take place from markets outside India.[4]

On the positive side, global integration of markets opens avenues for diversification through which investors would no longer need to be completely vulnerable to risks inside one country. In addition, if there are markets for related assets that trade at different times, superior forecasts of volatility can be obtained by observing the volatility of the related assets.

One such situation is the case of the Indian Global Depository Receipts (GDR) market, which can be used to better forecast the volatility of Nifty. In Indian time, NSE trades from 10 AM to 3:30 PM while the GDR market trades from 2:30 PM to 7:00 PM. Hence GDR prices capture information that has appeared after the Indian market has closed. In addition, GDR prices would be more sensitive in capturing shocks to international asset prices, and their influence upon Indian asset prices. Time series models which integrate the Skindia GDR index and the NSE-50 index show that the GDR index is useful in forecasting both the level and volatility of Nifty.

The Dollar–Rupee Exchange Rate

The dollar-rupee exchange rate is the subject of a high degree of policy involvement, and influencing this price is often considered to be a legitimate part of macroeconomic policy making. The RBI regulates this market, but it *also trades directly in the market*. This is in contrast to India's equity market, where policy makers do not generally have a view on where Nifty is going, and the extent of trading at the behest of the government is small when compared to market liquidity. This generates a different flavour of risk in the exchange rate.

This aspect helps us understand the time series in Figure 16.1. The overall σ of daily percentage changes in the exchange rate is 0.59 per cent. It is believed that the extent of RBI interventions into the currency market underwent major changes, thus demarcating the data into two distinct periods. From 1990 till 1995, the currency was primarily controlled by the RBI: it exhibited periods of very low volatility coupled with large, abrupt changes, such as the 23 per cent devaluation in July 1991 and the 10 per cent devaluation in March 1992. Over this period, the σ of daily percentage changes was 0.64 per cent. From 1 January 1996 till September

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[4] In the East Asian crisis of October 1997, Nifty index dropped by 7 per cent in a single day. Given that the σ of daily returns in this period was 1.7 per cent, a 7 per cent drop in the index was an unusual one, with a probability of less than 1 per cent of occurring.

1998, the extent of RBI interventions is considered to be smaller, the currency has displayed greater flexibility in terms of small, regular changes, and the σ of daily percentage changes dropped to 0.46 per cent. The most extreme one-day changes over the latter period are around 3 per cent.

This reduction in volatility illustrates the idea that a regime with price flexibility gives more realistic signals about price volatility to economic agents, and can actually yield less risk when compared to a regime with the illusion of zero price changes punctuated by sharp movements.

In Table 16.1, we see that there are statistically significant autocorrelations in squared returns on the dollar-rupee. ARCH models prove useful in forecasting currency risk (Thomas, 1998a). These models show that the time series structure of risk is qualitatively different over 1990–5 as compared to the more recent period.

This is illustrated in Table 16.4 which shows the VaR under comparable circumstances, using an ARCH model estimated over 1990–5 as compared to one estimated over 1996–8. This underlines two valuable ideas in understanding risk. The first is a reminder that institutional details and regime shifts have a major impact upon the models and parameter estimates that go into calculating VaR. The second is that greater government controls (1990–5) can yield greater price risk through a combination of months of fixed prices followed by very large adjustments.

TABLE 16.4
VaR of Dollar-Rupee

	1990–5	1996–8
Previous change in exchange rate (%)	0.5	0.5
$\sqrt{h_t}$	0.41	0.13
97.5% VaR	0.82	0.26

Note: This table shows the VaR of a dollar position in two regimes: the first from 1990 to 1995 and the second from 1 January 1996 till 1998. In each case, we assume that the previous one-day change in the exchange rate was 0.5 per cent, and seek to know the VaR at a 97.5 per cent level on a one-day horizon on a portfolio of Rs 100 held in dollars.

We see that the VaR has dropped sharply from 0.82 in the previous regime to 0.26 in the recent period.

The Call Rate

The call money market is India's most liquid interest rate market. It is primarily an inter-bank market for overnight loans. The call money market lacks non-bank participants, hence market volatility is extreme when the banking system, as a whole, needs to borrow or lend. Once every fortnight, on a 'reporting friday', banks have to satisfy reserve requirements, which often entails borrowing on the call money market. This generates much enhanced volatility on reporting fridays. In addition, there have been episodes, such as the RBI interventions in January 1998, where interest rate volatility has risen by five to ten times.

Models of the ARCH family prove to be quite useful in understanding the call rate. Over 1996–7, the standard

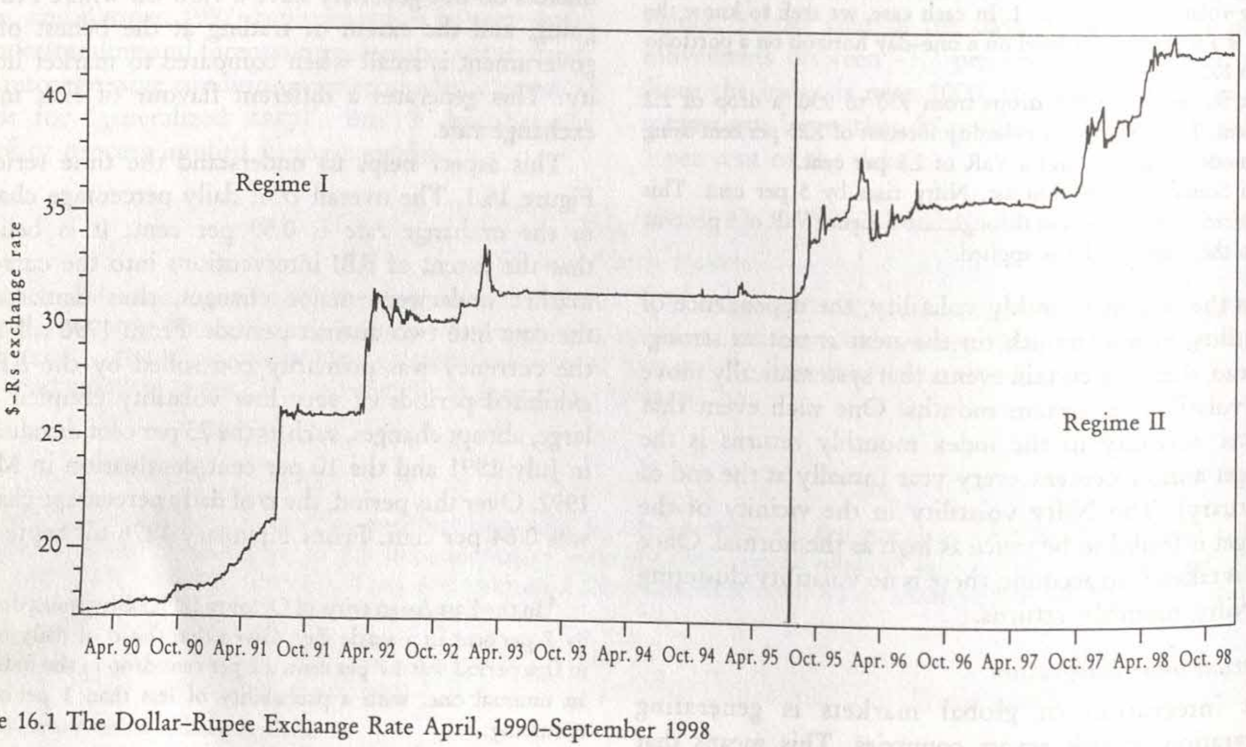

Figure 16.1 The Dollar-Rupee Exchange Rate April, 1990–September 1998

Box 4
The Risk in Owning Government Securities

In many public debates in India, we hear the suggestion that investments in government securities are riskless, or at least the least of all risks. One example of this is found in the requirement that the bulk of the assets of India's provident funds should be invested in government securities.

Government securities do, indeed, have near-zero *credit risk*, in the sense that default by the state is extremely unlikely.

However, government securities have exactly as much interest rate exposure as corporate bonds, and this exposure can be sizable. As an example, consider a bond which pays Rs 100 five years from today. Suppose the five-year interest rate is 11 per cent today. In this case, the bond price would be Rs 59.345.

Suppose the interest rate rises to 12 per cent on the next day. In this case, the bond price drops to Rs 56.743, a loss of 4.38 per cent in a single day. This is quite unlike the popular perception of 'government securities being risk-less'. A one-day movement of 4.38 per cent is not unlike the price changes seen on the equity market!

Government securities are immune to *credit risk*, but they have *price risk* deriving from interest rate fluctuations, like all fixed-income securities. This risk is a function of (a) time to maturity (longer dated securities are more risky than short dated securities) and (b) volatility in the yield curve.

deviation of changes in the call rate was normally 2 per cent, and rose to 6.8 per cent on reporting fridays. After 1998, institutional changes have led to a much lower level of volatility of the call rate. After January 1998, these values drop to 0.75 per cent and 2.75 per cent: a situation where reporting fridays are four times more volatile than other days.

DERIVATIVES: MARKETS FOR RISK

The worldwide derivatives industry, today, involves contracts worth trillions of dollars. When derivatives first rose to prominence, the size of these markets was a source of concern for some observers who feared that these markets were 'a giant ponzi scheme'.[5] Today, we understand derivatives more clearly, as a gigantic system of side bets which reshuffle the risk exposures of economic agents in the economy. The comparison of welfare with or without trade in risk is much like the comparison of welfare with or without trade in goods. Derivatives are the tools through which agents can 'trade in risk'.

One common motivation underlying derivatives trades is mutual insurance. The importer (who fears a devaluation of the rupee) enters into a contract with the exporter (who fears an appreciation of the rupee) through which each insures the other. This natural form of welfare-enhancing risk transfer can be achieved through derivatives such as futures, forwards, or options on the dollar–rupee exchange rate.

Derivatives come in two forms: those that trade anonymously at an exchange and those that are bilaterally negotiated. Exchange-traded derivatives benefit from the liquidity, transparency, and fair-play which accompany anonymous trading at an exchange. The derivatives exchange allows an anonymous trading environment through which each trader can obtain desired positions without suffering search costs in finding a counter-party with a mutuality of need. The contracts traded on exchanges are primarily futures and options. In addition, derivatives can be privately negotiated, in which case the contract which is negotiated is only limited by the human imagination. These privately negotiated contracts are called 'OTC derivatives'. OTC derivatives present greater problems in terms of institutional development as far as problems such as prudential regulation, liquidity, malpractice, etc. are concerned, but offer greater customization to suit individual needs.

Pervasive Hedging

A basic force in the formation and efficiency of firms is specialization, where firms obtain a high degree of knowledge about a few things. Yet, every primitive economy suffers from a tension between specialization and diversification. Specialization assists productivity growth, but highly specialized firms face high risks. Firms which seek safety through diversification lose out on the efficiency gains associated with specialization.

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[5] Named after Charles Ponzi, a famed swindler in the US in 1919. A Ponzi scheme is an investment scheme in which returns are paid to earlier investors, entirely out of money paid into the scheme by newer investors. See http://www.usinternet.com/users/mcknutson/

Derivatives assist in specialization by firms. For instance, a specialized garment producer would normally be exposed to cotton price fluctuations. He would need to invest in information processing and forecasting about cotton prices. Alternatively, the firm could become a well-diversified conglomerate, giving up the gains from specialization, and thus be less exposed to cotton prices. A cotton futures market allows the garment exporter to specialize, while eliminating his cotton price risk without needing to have a forecast about future cotton price movements.

In this fashion, each firm which is exposed to price movements—interest rates, currency movements, commodity prices, etc.—can afford to pay less attention to these price movements by hedging them away using derivatives. Once this is done, the firm would no longer be exposed to these risks, and it would be better able to focus on a few specialized forms of knowledge which assist in high productivity.

This reduction in risk does not leave expected returns intact. When risk bearing generates a 'risk premium' (which is not always the case), hedging using derivatives does eliminate this risk premium also. Hence owning a well-diversified equity portfolio earns the 'equity premium' (roughly 8 percentage points in excess returns, as compared to investing in government securities) and completely stripping off this risk using index futures eliminates this premium. The typical hedger cares more about removing risk than benefiting from these risk premia, when they exist. (see Box 5)

This understanding helps us comprehend how aggregate derivatives activity is of an order of magnitude comparable to GDP. An economy with liquid derivatives markets in the four major areas (interest rates, currency, equity, and commodities) would be one where every major firm would undertake derivatives transactions which are of an order of magnitude comparable to the firm value added. These would add up to give aggregate derivatives activity which is comparable to GDP.

Derivatives in India

In this subsection, we examine the state of the art of financial derivatives in India (Thomas, 1998b).

The dollar–rupee forward market: The dollar–rupee forward market is the most important existing derivative market in India. However, it is an OTC market, and the RBI has established barriers to access which exclude a large number of economic agents who are exposed to currency risk.

Exchange-traded derivatives: In the area of exchange-traded derivatives, the most important effort is that of the National Stock Exchange (NSE).[6] By late 1996, the NSE had completed the developmental work required

Box 5
Impact of Hedging upon VaR

This is a continuation of the examples of VaR calculations shown in Box 1. *Hedging* is used to reduce risk. Portfolios 3 and 4 from Box 1 are accompanied by short positions on Nifty futures to reduce the risk. The quantity of Nifty futures sold is based on a risk-minimizing calculation.

Portfolio 5:	TISCO	500,000
	State Bank	500,000
	Sell Nifty futures	–1,250,000
VaR		25,595
Portfolio 6:	TISCO	200,000
	State Bank	200,000
	Larsen & Toubro	200,000
	ACC	200,000
	ITC	200,000
	Sell Nifty futures	–1,200,000
VaR		17,316

Portfolio 5 is the same as Portfolio 3, with a short position on Nifty futures designed to minimize risk. Similarly, Portfolio 6 is the same as Portfolio 4, with a hedge position on index futures.

We can contrast the VaR values seen here with those seen in Box 1; we see that hedging dramatically reduces risk. Diversified equity portfolios can reach near-zero levels of risk after appropriate hedging is done. While undiversified portfolios enjoy significant reductions in risk once they are hedged using index futures, they still suffer from unsystematic risk.

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[6] See http://www.nse-india.com/marketlist/intro.htm

for running a stock index futures market; this included an electronic trading system; a clearing corporation which addresses credit risk using 'novation' (see Box 6), institutional arrangements governing trading members and clearing members, etc. From late 1996 onwards, the onset of index futures trading has been awaiting approval from SEBI. A SEBI-appointed committee, headed by L. C. Gupta, has drafted a policy framework for exchange-traded derivatives (Gupta, 1998).[7]

Box 6

Anatomy of a Derivatives Exchange

From 1995 onwards, the NSE has worked towards creating exchange-traded derivatives (Chauhan, 1998) What does this entail? What are the components of an exchange where derivatives trade?

Trading system: The NSE has built a computerized trading system for trading index futures and index options. This will trade using satellite communications, utilizing the same facilities presently used for trading debt and equity on the NSE.

Clearing corporation: The National Securities Clearing Corporation (NSCCL) is a risk containment institution which interposes itself into every trade. When *A* buys from *B*, at a legal level, *A* buys from the NSCCL and *B* sells to the NSCCL. This is called 'novation', and it eliminates credit risk from the market—if *A* defaults, *B* is not affected. The NSCCL has done novation on a one-week futures market (equity trading at the NSE) from 1996 onwards. The NSCCL would do novation for futures and options trading at the NSE.

Product design: The NSE has designed futures and options products around the new NSE-50 index (Shah and Thomas, 1998).

The intermediary: The institution of the intermediary is an important aspect in market design (Shah, 1998b). Exchanges in India have traditionally had a single category of brokers. Derivatives exchanges, internationally, use a two-tier membership where 'clearing members (CMs)' are subject to high net worth requirements, and take responsibility for the trades of 'trading members (TMs)', at a fee. This CM/TM structure has been recommended by the L. C. Gupta Committee and adopted at the NSCCL, with weaker collateral and net worth requirements for TMs as compared to CMs. This allows for a proliferation of TMs, while confining credit risk to a small core of CMs.

Knowledge: There is a mandatory requirement that each individual who actually trades on the NSE terminal has to have passed a certification examination ensuring a minimal competence in the area of derivatives. The NSE has created a certification in index futures.*

Regulation: The NSE has defined a framework of inspections, bye-laws, etc. required for a well-functioning index derivatives market.

*See http://www. nse-India.com/marketlist/ncfmintro.htm

The L. C. Gupta committee had recommended that the initial margin should be set at a 99 per cent VaR on a one-day horizon. SEBI then set up a committee, headed by J. R. Varma, to translate this into an operational model.[8]

Legal hurdles: Index futures are 'settled in differences', and no shares change hands when index futures trade or settle. This has led to legal concerns about whether index futures trading would constitute wagering. Through 1996 and 1997, it was expected that this could be clarified using a notification, but in 1998 the law ministry felt that an amendment to the Securities Contract Regulation Act (SCRA) was required. This amendment is pending before parliament at the time of writing. Such cash settlement is essential to the development of derivatives markets, and hence this amendment would be an important milestone in creating the enabling legal infrastructure for the financial system.

Commodity futures: The NSE's index futures market would be India's first exchange-traded *financial* derivatives. However, futures based on agricultural commodities have been traded in India for many years. In recent years, there has been renewed interest in extending the scope of commodity futures markets, both in terms of the products traded and in terms of access for foreigners to Indian futures markets. However, the institutional development of commodity futures markets, as of today, is primitive. Commodity futures markets in India, today, suffer from trading by open outcry, the lack of a clearing corporation which does novation, the conflicts of interest which derive from brokerage firms running the administration of the exchange, etc.[9]

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[7] See http://www.sebi.gov.in/News/main.html

[8] See http://www.sebi.gov.in/report/varindex.html

[9] See http://www.igidr.ac.in/~ajayshah/INDIAFINANCE/commodities-interview.html

Interest rate derivatives: In the area of interest rates, the most liquid market in India is the inter-bank call money market. Since an inter-bank deposit cannot be delivered, a futures market on the call money rate would have to be settled in differences (i.e. cash settlement). This raises the importance of a reliable reference rate against which the expiration value of derivative contracts can be undertaken. In 1998, dissemination of reference rates has commenced for one-day, 14-day, 30-day, and 90-day inter-bank interest rates.[10] The fall off in liquidity across these durations suggests that progress is most likely in terms of futures or options on the overnight rate.

Access to markets offshore: In response to the recommendations of the Committee on Capital Account Convertibility (Tarapore, 1997), the RBI appointed a committee headed by R. V. Gupta to define guidelines through which Indian firms could access commodity derivative products trading outside India.[11] The principal recommendation of the R. V. Gupta Committee is that firms should be free to use exchange-traded derivatives from exchanges outside India for the purpose of hedging. In 1998, many Indian firms initiated hedging strategies utilizing this element of liberalization.

Indian derivatives trading offshore: The restrictions placed before foreign users of the dollar–rupee forward market, and the delays in the onset of equity derivatives, have led to the development of Indian derivatives trading outside India. A market called the 'non-deliverable forward market' allows cash-settled contracts on the dollar–rupee exchange rate. A variety of index options are traded on the NSE-50 and BSE 'sensitive' index. Derivatives exchanges such as SIMEX (in Singapore) have expressed interest in trading index futures on Indian stock market indexes.

Regulatory fragmentation: Finally, the regulatory structure for derivatives in India is fragmented between SEBI (which has jurisdiction over exchanges), the RBI (which has jurisdiction over fixed income and currency markets, and banks), and the Forward Markets Commission (which regulates commodity futures markets). Such a regulatory structure is cumbersome and inefficient. The modern understanding of derivatives emphasizes the abstract nature of a derivative product—a futures on crude oil is a lot like a futures on Nifty. The knowledge involved in building market institutions is common, regardless of what the underlying is. In this sense, India's financial system needs a well-functioning derivatives exchange, which trades futures and options on currencies, interest rates, equities, and commodities. The fragmentation of regulators, as of today, ensures that such unification cannot come about.

RISK AND THE CONDUCT OF ECONOMIC POLICY

The liberalization process of the 1990s has exposed individuals and firms in India to a new form of risk, i.e. price risk. Traditional instruments for risk management, i.e. lobbying for government interventions, are less effective in a market economy. Individuals and firms in India had large investments in traditional techniques of risk management. The liberalization of the 1990s exposed firms and individuals to a new regime of price risk; however, with the exception of the dollar–rupee forward market, there was no progress on access to derivatives. This problem partly explains political opposition to price flexibility.

Today, in India, a 0.5 per cent movement in the currency is front page news. Currency movements are the subject of political lobbying and political decisions. This reflects the problem that myriad economic agents have currency exposures which cannot be hedged using the existing dollar–rupee forward market. Active currency futures and options markets, accessible to anyone in India, will reduce the importance of currency movements; they would hence pave the way for an economic policy regime of greater currency flexibility.

Diversification, insurance, and derivatives are the three modern tools for risk management. In India, market institutions which offer insurance and derivatives are highly undeveloped. Alongside this development, firms and individuals need to obtain the skills required in risk measurement and derivatives. When firms and individuals are equipped with this knowledge and these tools, price volatility will generate a smaller outcry in the newspapers. This transition will generate welfare gains, and pave the way for volatility-enhancing economic reforms.

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[10] See Shah (1998a) and http://www.nse-india.com/marketlist/mibor.htm

[11] See http://www.igidr.ac.in/~ajayshah/INDIAFINANCE/rvgupta/report.html

17

Rethinking Prudential Regulation

Ajay Shah and Susan Thomas

The East Asian crisis has given a fresh sense of urgency to the problem of financial system fragility. Prudential regulation of finance companies has always been important; what is new is the sense that failures on this front can have major consequences for macrostability. In this chapter, we evaluate the issues involved in creating a framework for prudential regulation which is compatible with the financial markets we see around us today.

Prudential regulation is concerned with influencing the fragility of firms. Firm robustness is not an end in itself; the major concern of prudential regulation is the externalities which are experienced, including the potential of a general crisis, when a few large firms fail. In this chapter, we focus on two distinct problems: *firm failure* (which is addressed by analysing the risks that the firm is exposed to) and *the mechanism for contagion*, through which the failure of one firm imposes externalities upon other firms. In many situations, the problems of prudential regulation are greatly diminished if these mechanisms for contagion are directly blocked through careful institutional design.

There are three major classes of finance companies: banks, mutual funds, and brokerage firms. Traditionally, the prime focus of prudential regulation has been banks. This is an incomplete conception in a world where the importance of banks in financial intermediation has been steadily shrinking (Litan, 1991).

The three classes of shocks we think of are market risk, credit risk, and liquidity risk. Traditionally banks have been about credit risk, and brokers and mutual funds have been about market risk. These stereotypes are no longer quite valid. Banks are increasingly moving away from non-securitized credit risk exposure and taking on market risk and liquidity risk. Bonds are steadily gaining on loans as a vehicle for debt financing. Brokers and mutual funds are taking larger exposures to credit risk, owing to investments in corporate bonds and positions on OTC derivatives markets, and are more concerned with credit risk management.

Finally, we should note that credit risk and market risk are closely related. Many a firm defaults on obligations (generating credit risk) when it has made losses with respect to market risk. Similarly, diversified credit risk portfolios are strongly sensitive to macroeconomic fluctuations (Rakshit, 1998)—a macroeconomic downturn would lead to more defaulting firms.

Thus, we see a certain convergence among the three categories, and a piecemeal approach is increasingly untenable. Hence, in this chapter, we will try to obtain an integrated view of the challenges of prudential regulation, spanning banks, mutual funds, and brokerage firms.

THE SOURCES OF FINANCIAL FIRM FRAGILITY

Fragility of finance companies is critically linked to two problems: leverage and investments in illiquid assets which are traded on non--transparent markets.

Leverage

Suppose a company has Rs 10 of shareholders' funds. Conventional capital adequacy requirements would allow the firm to borrow Rs 90 and deploy the total of Rs 100 into various assets. This is leverage by a factor of 9:1. Leverage is the central source of fragility of finance companies.

Leverage magnifies the returns on investments of the finance company, whether in the positive or negative direction. Suppose a finance company expects to obtain a 15 per cent return on some investment, and the cost of funds is 10 per cent. If the shareholders' funds alone are invested, then Rs 10 yields Rs 1.5. Once Rs 90 are borrowed, the total investment of Rs 100 yields Rs 15 when invested at 15 per cent. The interest cost of the debt is Rs 9, leaving a profit of Rs 6, as compared to the profit of Rs 1.5 without leverage. In this example, the debt-intensive strategy has raised the return on shareholders' funds from 15 per cent to 60 per cent—hence the term 'leverage'.

The dark side of leverage shows up when losses are made. When an investment of Rs 100 is backed by Rs 10 of equity, a loss of just Rs 10 (a return of -10 per cent), renders the firm bankrupt. When losses take place, we see the role of equity capital as a 'buffer'. Low capital adequacy requirements imply that the buffer is small. If, instead, capital adequacy requirements insisted on Rs 20 of capital when Rs 80 were borrowed, then the firm would be able to cope with a larger loss of 20 per cent before reaching bankruptcy. A firm that supplemented Rs 10 of equity with just Rs 10 of debt could endure a loss of -49 per cent on its investments without becoming bankrupt.

In periods when returns on investments exceed the cost of funds, highly leveraged firms earn higher profits than less leveraged firms. Conversely, in periods when investments yield low returns, less leveraged firms are more likely to survive, and highly leveraged firms are likely to fail.

Liquidity

The simplest environment is one where the firm uses the funds to buy liquid assets which are traded on a transparent market, such as an anonymous electronic exchange. In this case, there are three, distinct consequences:

1. Access to secondary market data enables 'marking to market', where the portfolio is revalued daily. Hence the finance company would be able to know the true value of its assets. This is in contrast to illiquid assets, where losses are often not recognized as such.

When the firm has derivatives positions on an exchange, then the clearing corporation imposes the discipline of daily 'marking to market', which forces the firm to fully pay up all losses on a daily basis. In contrast, off-exchange derivatives positions are more dangerous in so far as losses can be hidden or ignored.

2. Access to secondary market data makes it possible to create statistical models of price processes, which can lead to VaR estimates. Without this data, VaR estimation is extremely hard.

3. Liquid assets make it possible to reduce risk by selling off a position. When assets are illiquid, hedging using derivatives is the only possibility for reducing risk exposure.

This link between market liquidity and transparency, with risk measurement and management, lends a new dimension to market design. Traditionally, the accent on anonymous trading on an electronic exchange has been motivated by the objective of maximizing *market liquidity* (Shah and Thomas, 1997, Shah, 1999). Here, we see a new motivation, which links up improvements in market quality with a greater ability to *measure* and *manage* risk. Non-transparent and illiquid markets imply a reduced ability to measure and manage risk.

From this perspective, a corporate bond which is actively traded on a secondary market is a superior form of organization when compared to a traditional loan, which is negotiated privately and not traded on an exchange. Credit risk measurement is intrinsically difficult, but it is enormously easier for liquid bonds as compared to non-traded loans.

The Distinction between Profitability and Fragility

It is common to associate profitability with the lack of fragility. Profit measures are derived from conventional accounting procedures. However, a fuller appreciation of risk generates a difference between the health of a company, as measured by profitability, and the sense of fragility as seen in risk measures such as VaR and insolvency probability.

A finance firm may register a sharp rise in profits, yet it may simultaneously become highly vulnerable. This distinction can arise from off-balance sheet liabilities. Consider a firm which short sells a large quantity of options on an OTC market where no collateral is required. In this case, the profit and loss statement of the firm would show a revenue inflow from selling these options. However, there is the lurking liability that if the options are exercised, at a future date, the firm could be adversely affected. Selling the options clearly increases the VaR of the firm, however this is not reflected in traditional accounting procedures.

In the context of mutual funds, this problem leads to the notion that the fund NAV should reflect the market price of the *complete* position of the fund. Hence the short position on options should be part of the portfolio when NAV calculations are made.

This example emphasizes the regulatory convenience associated with liquid assets that are traded on an anonymous electronic exchange; publicly observable and reliable prices can then be used in the comprehensive marking to market which all companies should do in their accounting procedures. In contrast, off-exchange contracts on illiquid financial contracts present difficulties in valuation and reduce the usefulness of accounting data.

Mutual Funds: The Safest of Finance Companies

It is interesting to note that the most secure finance firms in India today are some mutual funds:

- Banks promise a fixed interest rate to depositors. Mutual funds generally make no such promise; hence the question of failure does not arise.
- The leverage that mutual funds are allowed is tiny when compared to banks.
- Many mutual funds only invest in highly liquid assets. This ensures that daily marking to market is meaningful, and good VaR estimates can be obtained.

Hence as long as mutual funds (a) do not promise assured returns and (b) restrict themselves to highly liquid assets,[1] there is little possibility of default. When mutual funds do assure returns, and these promises are implemented using modern risk management techniques—such as options—these assurances do not present problems for prudential regulation.[2] It is only when mutual funds make unhedged guarantees about returns that they face problems akin to those of banks.

OBJECTIVES OF PRUDENTIAL REGULATION

A central justification for prudential regulation is to help economic agents be confident about the maximum insolvency probability of all firms that they deal with. If insolvency were endemic, then all firms would expend greater resources in evaluating the credit risk of those they dealt with on every small transaction. Prudential regulation helps generate a relatively stable environment. Box 1 provides a discussion an systemic risk.

How Safe should Firms be?

Yet leverage and risk taking are central to finance. Every finance company must have a non-zero failure probability. What insolvency probability should prudential regulation target? Should prudential regulation aim to force each finance company to become AAA rated? A reasonable principle that regulators can use is to act much as the market would if there were no safety net and all market participants were fully informed. The international experience here leans towards a rating such as BBB rather than AAA, since very few unregulated entities that are not subject to a safety net obtain an AAA rating.

Hence a reasonable objective for regulators is to constrain firms in their risk taking so that their failure probability is no worse than a BBB bond, i.e. a failure probability of no worse than around 0.1 per cent per year.

Behaviour under Extreme Stress

If a firm has equity capital equal to the 99 per cent VaR of its portfolio on a one-week horizon, then it can expect to become bankrupt in one in a hundred weeks, or roughly once every two years. Most shareholders and regulators would hence demand greater capital adequacy as compared to this.

The quest for low failure probabilities can lead to stringent prudential regulation that copes with twice-in-a-century events. A 99.96 per cent VaR on a one-week horizon would only be exceeded once in 50 years. A 99.992 per cent VaR on a one-day horizon would only be exceeded once in fifty years.[3]

Such an effort is probably inefficient in blocking a great deal of capital. It is inadvisable to require finance companies to hold capital in amounts sufficient to protect against those rare systemic events. In addition, most VaR implementations fare poorly at accurately producing estimates for these 'extreme tail events'. Hence the errors implied in using these VaR estimates for capital requirements would be the largest.

The very function of the central bank is to reduce costs for the economy by providing emergency credit in extreme situations. Hence prudential requirements should not focus upon 'six sigma events'. As Alan Greenspan (1998) puts it, 'The management of systemic risk is properly the job of the central banks. Indeed, central banks, by their existence, appropriately offer a form of catastrophe insurance to banks against such events.'

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[1] The hundred most liquid stocks in India are members of the Nifty and Nifty Junior indexes.

[2] One design of a completely safe product which assures returns can be sketched. This is a mutual fund which invests Rs 90 into buying the NSE-50 index (i.e. like an index fund), and invests Rs 10 on buying a put option. Suppose Nifty is at 1000; in this case, the put option which costs Rs 10 would probably be at 900. This means that the fund is protected against any loss worse than −10 per cent-all losses that are experienced when Nifty drops below 900 would be reimbursed by the put option. In this case, the fund could *make the assurance to investors* that returns of worse than −10 per cent would never happen, and this assurance would be perfectly safe. In other words, assurances by mutual funds are safe when (and only when) they are, in turn, hedged using derivatives.

[3] If the returns on an asset obeyed the normal distribution, the 99.96 per cent VaR is a 3.4 sigma event, and a 99.992 VaR is a 3.8 sigma event. In practice, the VaR would prove to be much larger owing to the 'fat tails' problem.

Box 1

Systemic Risk

Many years ago, financial markets were but a small part of the economy. In recent decades, financial markets have grown to a point where many measures of financial market activity dwarf GDP. In economies with well-developed financial markets, three parameters are typically much larger than GDP: the total market capitalization of the equity and bond markets, the total annual trading volume, and the open positions on derivatives. In the case of India, with GDP at roughly $ 350 billion, the market capitalization of equity and debt adds up to roughly $ 250 billion, the total trading volume of equity alone comes to around $350 billion a year, and open derivatives positions are negligible. Internationally, it is common to find *a single firm* with open derivatives positions of a trillion dollars. When the hedge fund 'Long Term Capital Management' (LTCM) failed in 1997, it had positions of over a trillion dollars.

This leads to concerns about the externalities that follow from the failure of one finance company. An unceremonious closing out of the positions of LTCM (or UTI, in the context of the US-64 scheme) would distort market prices and impose externalities upon all users of financial markets. These externalities may justify prudential regulation which reduces the probability of failure of the firm. When firms do approach failure, regulators could be tempted to organize a bail-out, which generates the moral hazard of firms which are 'too big to fail' (TBTF); the shareholders of these firms stand to gain the upside from risk taking and not suffer the full downside from failure.

The most extreme concern is about a scenario where failures in the financial system generate macroeconomic instability. The focus here is upon *systemic risk*, where the financial system as a whole breaks down, and not failures of individual economic agents or financial intermediaries.

The most extreme scenario with systemic risk is that of a complete 'financial markets melt-down'. This scenario would commence with the failure of two or three giant financial institutions. Their failure would imply default on all their outstanding OTC derivatives positions, and would endanger myriad entities that expect to receive payments from them. In addition, the failure of a few large financial institutions would endanger futures clearing corporations. In the melt-down scenario, clearing corporations would also fail. All derivatives exchanges, worldwide, are tightly related in their risk exposures by common members and arbitrageurs. It is likely that in the melt-down scenario, if a few major clearing corporations and a few major financial institutions fail, all other clearing corporations would go down as well. It is hard to imagine how any component of the financial sector could continue to function in a crisis large enough to disrupt exchange-traded derivatives. In this melt-down scenario, where the international financial system breaks down, global capitalism would be thrown back into a financial stone age.

Prudential regulation thus has to walk a thin line. Low capital adequacy would generate an environment where failure is endemic; this would adversely impact upon macro-stability and reduce confidence in the financial system. Excessively high capital adequacy requirements would be wasteful of capital.

Incentive Compatibility of Regulations

Weak capital requirements, under the premise that the central bank will intervene in handling systemic risk, generate moral hazard for firms which expect bail-outs. This is one example of the pervasive ability of economic agents to change their behaviour in the light of a regulatory regime.

Given the complexity of financial instruments and trading strategies in the modern world, simplistic efforts at prudential regulation will be bypassed by 'regulatory arbitrage' where agents bypass rules. Every requirement by a regulator would generate a certain degree of regulatory arbitrage by finance firms. Hence we cannot ignore the reactions of economic agents to a given regulatory regime. Prudential regulation should be designed in a way that the allocative distortions associated with regulatory arbitrage are minimized.

EXISTING IDEAS IN PRUDENTIAL REGULATION

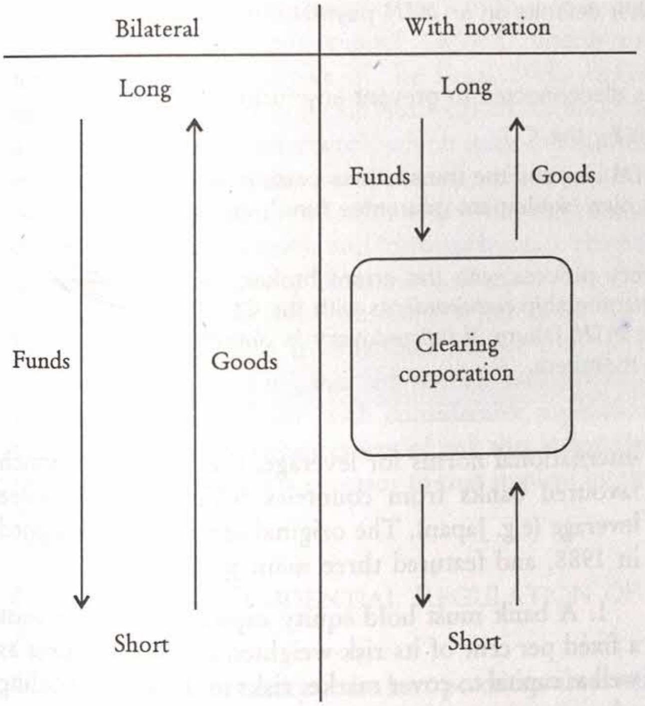
There are two major approaches towards capital adequacy observed in the world today. The first is that used by futures clearing corporations, which govern transactions that take place on an exchange. The second is that implied by the Basle Capital Accord, which governs the (primarily off-exchange) transactions of banks.

The Futures Clearing Corporation

When trading takes place on an exchange, liquidity is enhanced through a combination of product standardization and anonymity. Yet trading against an unknown entity could be extremely risky in terms of facing non-performance of obligations. The futures clearing corporation was a remarkable innovation which addresses this problem.

The reason why a firm *A* should be encouraged to be prudent in risk taking is linked to the externalities that are imposed upon other firms if *A* defaults. The futures clearing corporation eliminates this possibility using 'novation' (Figure 17.1). It becomes legal counter- party to both sides of the transaction, thus shielding each entity from the credit risk of the other. Hence, when *A* fails, the mechanism for contagion is eliminated by the clearing corporation.

The operations of a clearing corporation are a considerable challenge in terms of knowledge and the development of sophisticated market institutions (see Box 2). However, once a clearing corporation works correctly, novation at the clearing corporation fully addresses the concerns of prudential regulation. When a firm defaults, it generates no externalities, and market institutions continue to function without a hitch. There is no possibility of a 'domino effect' of cascading defaults since there is no mechanism through which failure of one firm can impact upon other users of the market. In addition, the objective of market soundness is achieved without the moral hazard associated with bail-outs—firms that make large losses reliably go bankrupt, without a rescue being attempted.



Note: This diagram illustrates the *legal* relationships on a market with bilateral settlement, where each leg of a trade is exposed to the credit risk of the other. The clearing corporation undertakes 'novation', where it interposes itself into the transaction, becoming the legal counter-party to both legs of the trade. In this fashion, it eliminates credit risk for both sides. If one leg fails, the *other* leg is insulated from the consequences, i.e. externalities associated with bankruptcy do not take place, and contagion is not observed. However, there is no attempt to bail-out the failing firm.

Hence the clearing corporation achieves robust functioning of markets without requiring bail-outs, or the consequent moral hazard.

Figure 17.1 Novation at the Clearing Corporation

The clearing corporation performs a credit enhancement function which makes anonymous, electronic trading *possible*. Trading without a clearing corporation always takes place within a small club of entities with homogeneous credit risk; the clearing corporation enlarges the market and lowers entry barriers by making *safe trading between strangers* possible.

India's first clearing corporation, the NSCCL, was created by the NSE.[4] It has been performing novation from 4 July 1996 onwards, which has led to a new regime of robustness on India's equity market. Other markets, lacking novation at the clearing corporation and featuring weaker notions of prudential regulation, continue to exhibit signs of fragility; e.g. the payments crisis on the Bombay Stock Exchange in June 1998.[5]

Novation at the clearing corporation also introduces a new element of *incentive compatibility* in the relationship between the clearing corporation and regulators. Analytical or procedural errors, or failures of enforcement, by the clearing corporation would generate losses *for it*. This is in contrast with traditional exchanges, which featured continual conflict between exchanges that favoured weak regulations and regulators who favoured stronger regulations. By exposing the clearing corporation to the financial consequences of firm failure, novation is a commitment device which ensures that the clearing corporation and regulator have the same objective, i.e. market robustness.

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[4] The only other clearing corporation in India is the First Commodities Clearing Corporation of India (FCCCI), which was created to handle commodity futures markets. However, the FCCCI does not yet do novation. Hence the NSCCL is the only situation where novation takes place in India.

[5] The traditional objective of market administrators and regulators in India was *preventing broker default*, since the process of resolving a broker default was cumbersome and synonymous with a failure of integrity of the market. With novation at the clearing corporation, this notion is obsolete—default by individual brokers is a normal part of market processes and need generate no externalities upon other users of the market. The focus of policy makers should now be reliable *pay-out* of securities and funds from the clearing corporation, which defines smooth market functioning.

Box 2
How a Clearing Corporation Works

The clearing corporation (CC) is exposed to considerable risk when it adopts the liability of the net settlement obligation of each brokerage firm. It is primarily a risk management institution which tries to deal with this risk in cost-minimizing fashion, while avoiding bankruptcy.

Mark-to-market (MTM) margin: In the *k* days that elapse between a trade and settlement, prices fluctuate. These price fluctuations lead to losses for one leg and gains for the other. Fluctuations over *k* days can be quite large. At the end, the losing broker is given a choice: to fulfil obligations at the cost of making losses, or to declare bankruptcy.

The MTM margin is designed to break a *k*-day loss into a sequence of one-day losses. At the end of each day, the position of each broker is revalued using present market prices. Brokers are required to pay in their paper losses in what is known as the MTM margin. The money received is paid to the broker who has made profits on his position.

With the MTM margin, the broker faces *k* questions: to pay the one-day MTM loss, or to declare bankruptcy. One-day movements are smaller than *k*-day movements, so the incentive to default is smaller.

Initial margin: In addition, the CC tries to hold collateral that is larger than the forecasted one-day loss. This further reduces the incentive for a broker to default on a one-day MTM loss payment. Initial margin is a function of the portfolio risk of the open position; it should be the one-day VaR at a 99 per cent level.

Procedure following broker default: When a broker defaults on an MTM payment, the CC goes through the following steps:

1. The trading computer of the errant broker is disconnected to prevent any further trading.

2. His open position is reversed on the market by the CC.

3. The broker owes 'the market' his one-day MTM loss and the transactions costs of reversing his position. The CC funds this shortfall out of its own 'settlement guarantee fund', and market processes continue to move on smoothly.

4. The CC now embarks upon a credit recovery process with the errant broker, including invocation of pledged assets which form part of membership requirements with the CC. The full dues may be recovered months or years after the MTM failure. If full recovery is obtained, the broker could come back into the fold of trading members.

In the larger picture, the clearing corporation is a robust, and incentive compatible, solution to the problem of prudential regulation of trades that take place on exchanges. In India, the creation of the NSCCL is an important milestone in market development. The NSCCL has successfully done novation with trading volumes in excess of Rs 3500 crore in a day, and successfully coped with over a dozen bankruptcies by member firms. This institution building opens the possibility of applying the clearing corporation to many other problems of market design in India.

When we get to details, however, many of the procedures followed by the NSCCL or required by SEBI are incorrect (see the fourth section). Incremental improvements here would improve prudential regulation of exchange-traded financial markets in India.

The Basle Capital Accord

The Basle Capital Accord is an understanding among the bank supervisory agencies of the G-10 member countries. It was motivated by the desire to obtain common international norms for leverage, the absence of which favoured banks from countries which allowed more leverage (e.g. Japan). The original agreement was signed in 1988, and featured three main principles:

1. A bank must hold equity capital equal to at least a fixed per cent of its risk-weighted credit exposures as well as capital to cover market risks in the bank's trading account.

2. When performance causes capital to fall below this minimum requirement, shareholders can retain control provided they re-capitalize the bank to meet the minimum capital ratio.

3. If shareholders fail to do so, the bank's regulatory agency is required to sell or liquidate the bank.

The Accord applies a linear formula for risk measurement. It divided assets into four risk 'buckets', corresponding to minimum total capital requirements of zero per cent, 1.6 per cent, 4.0 per cent, and 8.0 per cent, respectively. Much of the complexity of the capital requirements arises from rules stipulating which risk positions fit into which of the four capital 'buckets'.

The Accord has evolved incrementally over the years. In January 1996, an amendment took place, to introduce capital charges for market risk in a way that reflects VaR. This was based on the recognition of proprietary in-house models used by finance companies (Jackson, Maude, and Perraudin, 1998). Banks are required to hold 'market risk capital' which exceeds a conservative notion of the 99 per cent VaR on a ten-day horizon.

The Distinction between Regulatory Capital and Risk Capital

The technique of risk measurement embedded in the Basle Accord is incompatible with modern portfolio theory (Nachane, 1999). Yet banks have no choice but to satisfy these regulatory requirements.

This has led to a distinction between 'regulatory capital', the capital that regulators ask a finance company to hold, and 'economic capital', which reflects the internal perception of risk of the firm. Every major finance company in the world has worked on building a risk measurement framework which leads to a notion of economic capital. This is done for the twin objectives of (a) risk management, to ensure that the risks taken do not exceed certain levels and (b) for pricing, to require higher rates of return of more risky assets.

Over the last decade, considerable resources have been expended by large international finance companies in this endeavour. This has led to risk measurement systems coming into use with considerable sophistication. In general, the measurement of risk that is done by many of these systems is superior to that implied by the Accord.

FLAWS IN THE PRUDENTIAL REGULATION OF AN EXCHANGE

In this section, we critique the best practices observed, in India today, for prudential regulation of a secondary market: the procedures used at the NSCCL. Other exchanges in India feature inferior ideas and implementation of risk containment.

While this framework is fundamentally sound, there are numerous flaws on questions of detail. The existing regime is a patchwork of disparate policy initiatives from SEBI and from the NSCCL, many of which came about when reacting to a specific crisis. However, they exhibit numerous flaws, today, when viewed in totality:

1. There are basic errors in the implementation of the MTM margin. While clearing institutions charge firms that have lost money the MTM margin, they do not pay it to firms that have made money. The MTM margin is calculated by adding up losses on a per-stock basis, while ignoring positions on stocks that have made a profit.

2. 'Institutional investors' are exempted from paying margin, on the presumption that they present the market with no risk. This is a serious flaw. The international experience suggests that failure of institutions can and does happen. In addition, failures by institutions can potentially impose greater externalities upon the system when compared to the failures of retail investors or brokerage firms that the clearing corporation routinely addresses.

3. Initial margin should be calculated as a 99 per cent VaR on a *k*-day horizon, where *k* is the delay in moving funds using the payments system. This delay, today, stands at two to three days, and can come down to a few seconds once the RBI builds an electronic funds transfer (EFT) system. The VaR implementation used here should integrate price risk and liquidity risk.

Instead, initial margin is calculated today using a patchwork of ad-hoc rules, which emphasize 'gross exposure'. Gross exposure is a poor technique for risk measurement. Boxes 1 and 5 in Chapter 16 highlight the pitfalls of using gross exposure as a measure of risk. Portfolio 6 has more than twice the gross exposure of Portfolio 4, but it has less than half the risk.

4. Once initial margin is calculated correctly, and MTM margin is reliably enforced, the other kinds of margins presently used should be discontinued.

5. SEBI's limit upon trading volume, where brokerage firms are prohibited from doing a one-day volume in excess of 33 times their net worth, has nothing to do with risk containment and should be discontinued.

6. The distinction between 'trading members' and 'clearing members' that is coming about on the derivatives market has a valid role to play for the cash market also.

7. The L. C. Gupta committee has recommended that cross-margining should not take place, i.e. the initial margin should not be based on a single VaR for the overall portfolio of a firm across both cash and derivatives markets. However, such completeness in VaR calculation is analytically correct and should exist. Portfolio 6 (Box 5, Chapter 16) has less than half the risk of Portfolio 4 (Box 1, Chapter 16). Yet if cross-margining is prohibited, it will require twice the initial margin; i.e. it will be over--margined by a factor of around four times.

8. Margin calculations should be done at a per-investor level, and added on to the overall collateral requirements of the brokerage firm. Instead, currently, per-investor positions are not tracked.

It should be noted that these criticisms are about India's best functioning clearing mechanism, the NSCCL. The MTM and gross exposure policies criticized above have been uniformly imposed upon all exchanges by SEBI. When we turn to other exchanges, such as the Bombay Stock Exchange (BSE), standards of prudential regulation are inferior. The BSE does not have a clearing corporation doing novation. While the NSCCL uses a capital adequacy of 15 per cent, the BSE uses 5 per cent. The risk containment implications of *badla* on the BSE have not been adequately worked out. In addition, there is a history of failures of enforcement of stated policies on risk containment. These difficulties, in combination, help explain the periodic 'payments crises' which have taken place on the BSE, including the most recent one in June 1998.

FLAWS OF THE BASLE ACCORD

Incorrect Focus upon Inputs, not Outputs

In understanding the risk of a bank, we should distinguish between a *strategy* and its implications for *risk*. The strategy adopted by the bank consists of a choice of financial instruments and contracts, and portfolio formation. The risk outcome can be interpreted as a VaR number or an insolvency probability estimate.

Prudential regulation is primarily concerned with a risk outcome. Prudential regulation seeks to cap the insolvency probability; it seeks to ask all finance firms to have an insolvency probability of no more than some policy-determined constant.

Yet the Basle accord is silent on the insolvency probability. It is defined in the language of strategies. It speaks of classifying assets into risk buckets and sets fixed risk weights for each bucket. This approach is flawed for several reasons.

- It requires the regulators to know all about the contracts and portfolios that banks form,
- It gives banks perverse incentives for regulatory arbitrage, to exploit loopholes in the regulations,
- It is ill-equipped to cope with the continual process of change in financial instruments and trading strategies.
- Under different situations, complying with the Accord would generate different insolvency probabilities.

The Basle approach, if carried to its logical conclusion, requires the regulators to get involved in risk measurement and risk management, which are the legitimate areas for the *bank* to be choosing its path. The Accord is primarily about credit risk; however, in keeping with the spirit, regulators would have to talk about duration mismatches, liquidity risk, derivatives usage, etc. It is all too easy for regulators to start specifying which duration mismatches are permissible and those that are not, to specify the metrics employed in measuring a duration mismatch, etc. In a sense, regulators would have to run the bank.

Further, once regulators start specifying these operational details, *moral hazard is amplified*. The finance company would have greater legitimacy in requesting a bail-out when failure is impending, on the grounds that this failure was enabled by the poor risk containment criteria of the regulator, which it had faithfully satisfied.

Incompatibility with Portfolio Theory

A core idea of portfolio theory is to measure risk in totality. In the standard variance–covariance framework, portfolio risk is not additive; the risk of a portfolio is not a weighted average of the risk of instruments, and matters get more non-linear when derivatives enter the picture. The Accord is incorrect in its use of a linear formulation, which effectively ignores the fundamental concepts of diversification and hedging.

Consider a situation where a bank has a credit risk portfolio p_1, and positions p_2 against a clearing corporation. Ideally, the shareholders' capital should be adequate when compared against the VaR of the overall portfolio $p_1 + p_2$. Instead, using contemporary methods of prudential regulation, the bank would be incorrectly giving the VaR of p_2 to the clearing corporation as collateral, and then holding capital to support p_1 using the Basle Accord. The resulting capital adequacy would, in general, be quite different from that implied by a VaR applied to $p_1 + p_2$.

Illusion of Homogeneity

The Accord pretends that all securities assigned to one bucket have similar risk. All corporate bonds, for example, are assigned into the 8 per cent bucket. In practice, the internal models of sophisticated financial institutions are known to sort corporate bonds from 1 per cent to 30 per cent, reflecting the heterogeneity of credit risk. A bank which builds a portfolio of high risk corporate bonds is very different from one that builds a credit portfolio of low risk corporate bonds.

Incentive Effects

Prudential regulation based on the Accord generates perverse incentives for regulatory arbitrage. If the target capital adequacy of the regulator exceeds that of the bank, it will avoid low risk debt (for which it is forced to hold 8 per cent when the risk that it sees is lower) or vice versa. Further, securitization and credit derivatives can be used to selectively lay off risk. If a bank feels an asset requires capital of 1 per cent, and the Accord insists on asking for 8 per cent, there is strong incentive to remove it from the books. In the extreme, such 'cherry picking' would result in only those assets being left on the balance sheet for which economic capital allocations are greater than the 8 per cent regulatory standard.

This can lead to banks which are apparently sound in terms of meeting regulatory requirements but actually unsound in terms of holding undesirably risky portfolios.

At this point, we should observe that regulatory arbitrage is not bad in itself. In many cases, regulatory capital arbitrage acts as a safety valve for attenuating the adverse effects of those regulatory capital requirements that are well in excess of the levels warranted by the true economic risk. Absent such arbitrage, a regulatory capital requirement that is inappropriately high for the economic risk of a particular activity could cause a bank to exit that relatively low risk business, by preventing the bank from earning an acceptable rate of return on its capital. That is, arbitrage may appropriately lower the effective capital requirements against some safe activities that banks would otherwise be forced to drop by the effects of regulation.

To the extent that regulatory arbitrage takes the economy closer to the natural outcome under competitive markets, a regime with rigid regulations and clever arbitrageurs would feature better resource allocation than one without arbitrageurs. Regulatory arbitrage generates difficulties in three directions:

(a) It generates misleading signals about insolvency probabilities for regulators and for other firms,

(b) It involves wasteful expenses (e.g. lawyers, accountants) for the economy,

(c) It presents supervisors with difficult judgments about what constitutes 'appropriate' regulatory arbitrage and what constitutes 'inappropriate' fraud.

The Illusion of Safety

The Basle Accord is, today, widely respected by the banking community. To many bankers, satisfying the Accord is adequate proof of risk management; it is a satisfactory alternative to understanding risk. In India, we see banks claiming that they 'exceed' the Basle requirements. This illusion of safety is perhaps the most harmful of the consequences of the Accord.

THE WAY FORWARD

The preceding discussion may be summarized in four issues:

- VaR is an important advance, in so far as it offers a way of specifying insolvency probabilities rather than capital ratios.
- Novation at the clearing corporation is a way of producing incentive-compatible requirements for capital adequacy, using sound risk measurement based on insolvency probabilities, while blocking the mechanism for contagion, and without generating moral hazard.
- VaR estimation is fraught with 'model risk' when portfolios contain financial contracts which are not traded on liquid and transparent markets.
- The Basle Accord, which is an attempt at writing thumb-rules for risk measurement in the context of off-exchange credit risk exposures, has serious flaws.

From this perspective, progress can be made by applying the concepts of novation and VaR in a larger class of financial contracting. An example of this is presented for the 'repo' market in the first subsection. In the next subsection we take stock of the problems with the Accord and how these can be mitigated. This includes the new ideas of the 'pre-commitment approach' and 'internal models'. The third subsection examines a proposal for a successor to the Accord. Finally, in the last subsection we take stock of the problems of banking in a world where prudential regulation of banks is hard to perfect.

Repos: A Case Study in Prudential Regulation

The repo (Figure 17.2) is an interesting financial contract where methods of risk containment can be applied. There are two interpretations of a repo, both of which are accurate:

A bundle of a spot and forward transaction: In the spot transaction, B buys securities, worth c_0 on the secondary market, for a price of Rs 100 from A. At the same time, both sides enter into a forward contract whereby B will sell back the securities to A on date T at the price $100(1 + r)$.

A fully collateralized loan: On date 0, A borrows Rs 100 from B and pledges securities worth $c_0 = 100+h$ as collateral with B. Here h is the 'haircut' or 'initial margin'. At a future date T, A is required to repay $100(1 + r)$ to B and get back the securities, which are then worth c_T.

As with any forward market, credit risk is present in the repo. If $c_T < 100(1 + r)$, i.e. the collateral is

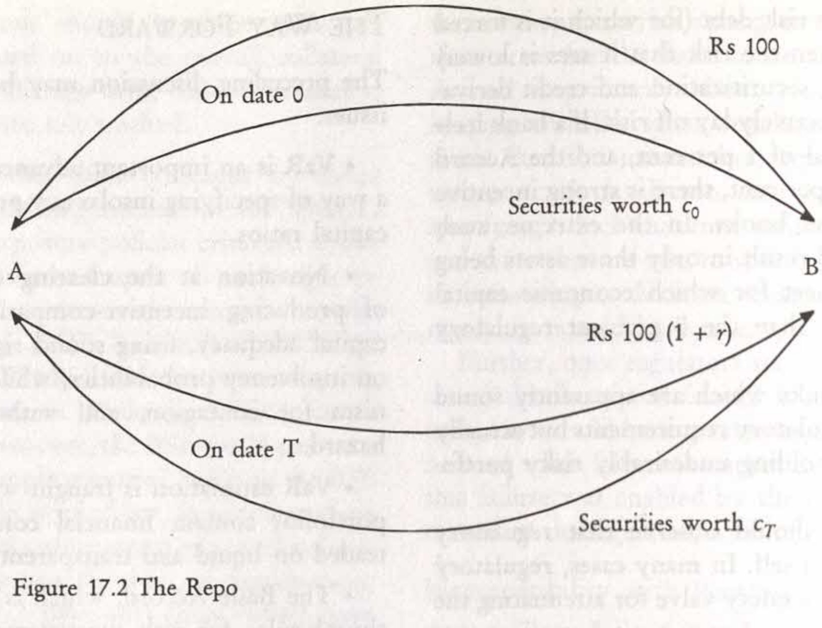

Figure 17.2 The Repo

inadequate on date T, A lacks incentive to bring up funds of $100(1 + r)$ in order to obtain securities worth c_T. Conversely, if the collateral is more than adequate on date T, i.e. $c_T > 100(1 + r)$ then B lacks incentive to give back securities worth c_T in exchange for an inferior amount of funds $100(1 + r)$. The incentive to default is only absent on a 'razor's edge' condition: when c_T is exactly $100(1 + r)$.

In addition, there are problems associated with illiquid securities. A could borrow large sums of money by manipulating the price of an illiquid security and using it as collateral. In addition, when A defaults on repaying the loan, B would suffer from market impact cost when liquidating the securities.

Existing market practice in India's repo market is quite primitive in terms of understanding and controlling these risks. The RBI has capped T at fourteen days, restricted market access, and limited the securities which can be repo-ed. This does solve the problems, at the price of placing severe restrictions upon the repo market.

The ideas of initial margin and MTM margin can be applied to address these problems. The initial margin would depend upon the VaR of the collateral, integrating price risk, and liquidity risk. While this would depend upon the identity of the securities, the interest rate would not.

In India, given the primitive state of the debt market, the 'model risk' faced in VaR estimation for a wide variety of portfolios is considerable. Most bonds and many shares are so illiquid that VaR estimates would be highly imprecise. Repos would only work with safety for the class of assets where VaR estimation is relatively reliable.

At the simplest, we could imagine repos taking place where A and B undertake these calculations. This runs into several problems:

- The counter-parties for each repo that takes place would require the knowledge and systems that are required for such calculations of VaR, enforcement of MTM margins, etc. It would be expensive for all economic agents who use repos to acquire such systems.
- Regulators would face severe operational problems if they have to deal with privately negotiated repos across thousands of economic agents in the economy. A high degree of discipline is required in order to ensure that (a) illiquid assets are not accepted, (b) VaR is calculated correctly, (c) the MTM margin is calculated daily, and (d) the entire contract is closed out if a single MTM payment fails to arrive on time. It is all too easy to have A and B who have a 'good relationship' with each other, where all these ideas are applied with laxity.
- When A and B enter into contracts directly with each other, the failure of one hurts the other. When a sufficiently large entity fails, regulators would be tempted to organize a bail-out, with the consequent problems of 'too big to fail' and moral hazard.

The 'technology' of novation at the clearing corporation can be applied to find a better solution to these problems. Here, A would face the clearing corporation as counter-party, and the clearing corporation would face B as counter-party. The clearing corporation would charge initial margin and require daily marking-to-market.

The clearing corporation would require considerable sophistication in economics and in IT for calculation of VaR, daily marking-to-market, etc. However, market participants would not require comparable sophistication; they would be able to concentrate on trading in the repo market, with a focus upon interest rates and not credit risk. This trading could either take place on an exchange, or contracts could be privately negotiated; the clearing corporation's role would commence after a trade is agreed upon.

From a prudential regulation standpoint, the regulator would have a single point in the economy—the clearing corporation—where enforcement would take place, to ensure that the initial and MTM margins are being correctly calculated and enforced. This enforcement would be incentive compatible: if the clearing corporation failed to enforce rules, it would stand to lose money when defaults take place.

With a good risk containment system, the repo is a pure interest rate instrument. The only thing that market participants would trade is r, the interest rate. When prudential regulation and the risk containment system are inadequate, as in India today, repo trading involves a complex blend of interest rates, the identity of counter-parties, the identity of securities, and the size of the haircut.

Improvements upon the Accord

Are the criticisms of the Basle Accord a question of incremental improvements upon a sound paradigm or do they imply that the Accord is fundamentally unsound? There are two major issues in which the criticisms of the Accord do not reflect normal incremental change:

- prescribing capital ratios instead of insolvency probabilities, and
- ignoring portfolio theory in risk measurement.

When regulators make the transition from ratios to probabilities, and move into using full portfolio analysis, it will be a paradigm shift in prudential regulation; it will not be the normal and routine incremental evolution of norms.

Focus upon Outputs, Not Inputs

The appropriate role for a regulator is to discuss insolvency probabilities, and not the details of instruments and portfolios that a finance company forms. This change will come about, in part, because supervisors will find it harder to formulate precise rules to regulate the increasingly sophisticated activities of financial firms.

Regulators could usefully take interest in improving internal risk measurement and management processes in banks. Such an approach would reinforce the market incentives which have, in any case, prompted banks to undertake large investments in information systems and tools for quantifying, pricing, and managing risk.

Knowledge Applied into Supervision

Regulators will need to enhance the knowledge and human skills that are applied into supervision. This would be in contrast to the world of the Basle Accord, which involved simplistic rules that were easily enforced without an understanding of finance. In the context of bank capital adequacy, supervisors must increasingly be able to assess sophisticated credit risk measurement systems, as well as gauge the impact of the continued development in securities markets.

The phenomenon of finance companies having superior knowledge and systems for risk measurement, as compared with regulators, should generate concerns about the supervisory capacity. The best analytical tools should be placed in the hands of highly trained and motivated supervisory personnel.

The order of magnitude mismatch which presently exists between the wages of supervisors and the wages of the supervised is fraught with danger, both in terms of the inability of regulators to attract the best talent and the potential for corruption.

Quantifiable versus Non-quantifiable Risks

This chapter has emphasized the role for models which reduce portfolios into risk measures. This leaves unaddressed two classes of non-quantifiable risk: (a) the risks that derive from poor models, and (b) the non-economic operational risks such as the breakdown of internal controls.

Quantifiable risks are satisfactorily addressed using capital adequacy. Model risk should be addressed by giving the finance firm incentives to produce good models. Operational risk can only be addressed using auditors and policemen.

Market like incentives can be used to reward and encourage improvements in internal risk measurement and management practices. A primary example is the 'pre-commitment approach', which has been proposed by the Federal Reserve in the US, for setting capital requirements for bank trading activities. Under the pre-commitment approach, a bank itself decides how much capital it will hold within a given period to cover the risks arising from its trading book. The regulator applies sanctions if the accumulated losses exceed that amount. In addition, these model errors would be publicly disclosed, thus penalizing the firm in terms of the cost of capital that it has to pay in all dealings with other firms.

Learning from Risk Models Used by Sophisticated Finance Firms

The best finance firms, today, have systems for risk measurement which are enormously more sophisticated than the Accord. Regulators should use these systems to learn about the inadequacies of existing rules.

Scrutiny of the Market

Finally, supervision and regulation cannot substitute for scrutiny of a firm by counter-parties in off-exchange transactions, where both counter-parties are exposed to credit risk. Hence efforts to contain the scope of the safety net, efforts to minimize the 'too big to fail' attitude, and improvements in the quantity and quality of disclosures, would help (a) reduce the extent to which failures are unexpected, and (b) generate incentives for a firm to reduce its cost of capital by decreasing its insolvency probability.

One Concrete Proposal for a Successor to the Accord

John Mingo, an economist at the Federal Reserve in the US, recently proposed (Wilson, 1998) a method through which a maximal insolvency probability could become the main focus of a regulator:

1. Regulators would go into a bank and evaluate the internal models that it uses for risk measurement. The bank would be required to have a comprehensive risk management framework which covers market, credit, and operational risk.
2. If the model is considered adequate, then the bank would be regulated by requiring equity capital which is enough to generate an insolvency probability of below 0.12 per cent per year (roughly a BBB bond).
3. If the models are considered inadequate, then the bank would be subjected to a conventional regulatory regime, using the Basle Accord.

This proposal emphasizes that all finance companies cannot be regulated on the same platform. It can well be that sophisticated financial intermediaries—featuring a rich array of risks, high level of usage of securities markets and derivatives, and possessing knowledge and models in connection with risk—are very different in the choice of an efficient regulatory regime as compared to many traditional banks.

Mingo's proposal involves falling back on the Accord when the internal models of a bank are considered inadequate. This appears quite unsatisfactory, given that the Basle norms themselves would be considered grossly inadequate if some bank proposed them as the internal model! Our objective should be *to find a match between the demands of risk management implied by the strategies of the bank, and the risk management capabilities available.* Hence step 3 of his proposal should be modified as follows: banks with poor risk management capabilities should be steered towards *strategies which make the least demands in terms of knowledge of risk management.* Their assets should be restricted to highly liquid exchange-traded securities, where marking-to-market and VaR estimation are the easiest.

In India, there has been discussion about requiring 'weak banks' to become 'narrow banks'. This is conceptually close to the above proposal, with two differences. The discussion above suggests that the definition of a weak bank should be based on knowledge rather than conventional accounting notions. In consequence, the strategies of weak banks should be constrained to the simplest risk management problems, which are found when investing in securities with liquid and transparent markets.

The Limitations of Banking

The fragility of banks in India derives from four problems:

- high leverage,
- illiquid assets and an emphasis on non-transparent trading mechanisms,
- duration mismatch between borrowing and lending, and
- primitive knowledge of risk management.

In addition, banks suffer from agency conflicts between employees and shareholders, which are particularly acute with public sector banks. Public sector banks suffer from the unique moral hazard that derives from state ownership, which implicitly assures a bail-out when bankruptcy is impending.

At the best of times, this combination of weaknesses would be a dangerous one. While improvements to prudential regulation would undoubtedly help, they are not sufficient to produce robust banks (Caprio, 1997). In the light of the complexity of these problems, we should recognize the limits to the role which banks can play in India's economy. As the Nobel Laureate, Merton Miller puts it (1998):

> Improve banking institutions, yes. But recognise that banking itself is at the root of the problem. Banking is a disaster-prone, 19th century technology not easily tamed. Endowing both banks *and* regulators with the right incentives to finance industry while avoiding catastrophic collapses is not yet a fully solved problem. Nor will it ever be, given the moral hazards posed by the absurdly high leverage ratios in banking, by deposit insurance, by the doctrine of too big to fail, and by the increasing likelihood that the IMF always stands ready in the wings to bail out bad banks

and bad creditors generally. Southeast Asia and China must look ahead ultimately not just to reforming their banks, but to reducing their dependence on banks as suppliers of capital to industry.

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18

The East Asian Crisis of 1997 Some Implications for India

Subir Gokarn

INTRODUCTION

It is clear that the intensity of worldwide concern with the East Asian crisis is a direct consequence of the past success of these economies. They were being held up as role models for the developing world. Though many of the policies they adopted did not fully meet with the approval of, for instance, the World Bank (World Bank, 1993), the basic outward-oriented thrust represented by aggressive export promotion was accepted as a major reason for their success. This was largely attributed to the incentives to efficiency within the domestic economy that such policies generated. It is therefore of great concern to the rest of the developing world if the collective crisis of these economies is inherent to their particular growth path.

The position taken in this chapter is that the crisis can indeed be interpreted as a consequence of the growth strategy. It builds up a theoretical explanation of the crisis by linking up the *proximate* factors associated with the crisis with the structural factors, which represent conditions created in these economies as a result of their growth performance over the last two or three decades. Broadly speaking, structural factors are those associated with the long-term behaviour of the economy; in this particular context, we use the term to cover aspects of the 'East Asian' model of growth. Proximate factors are associated with characteristics of the economy that make it vulnerable to unanticipated shocks, internal or external. (The classification of variables into these two categories that we have used in our analysis is presented in Table 18.1, later in the chapter.)

Such a broad-based theoretical explanation encompasses several of the explanations now current in the literature, but it also goes somewhat further in allowing us to draw 'lessons' from the event.

The chapter is organized as follows. The second section uses some theoretical and empirical perspectives as a basis for a simple generic model of crises. The next section uses this framework to organize and selectively interpret current analyses of the crisis. The fourth section provides an explanation of the specific proximate and structural factors at work in the East Asian context, and their interrelationship. The fifth section uses the proximate–structural approach to assess India's vulnerability to a similar crisis. The last section summarizes the main arguments and their implications.

PERSPECTIVES ON CRISIS

What happened in East Asia is fairly typical of what is referred to as a 'currency crisis' in the literature. Contemporary literature on the subject is now conventionally categorized into two generations. The first generation of models was initiated by Krugman (1979). In this class of models, crisis is precipitated by sharp increase in domestic money supply, typically the consequence of monetization of budget deficits. The cause of rising deficits is itself left unspecified. The second generation of models, initiated by the work of Obstfeld (1996) does not disagree with the mechanism postulated in the first generation. However, it endogenizes the government's decision to increase spending and/or lower taxes or defend an unsustainable nominal exchange rate, which then sets in motion the fiscal-monetary mechanism that precipitates the crisis. The

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basic intuition in the second generation approach is that the government has an interest in pursuing a policy which is viewed as unsustainable by the market. It also has the power to withstand attacks on, say, the exchange rate which are motivated by the perception of unsustainability. Market participants, knowing this, will wait to launch an attack only when the government's ability to defend it is perceived as being weak. The crisis is, in a sense, the decision of the government to defend an ultimately indefensible target for too long.

The two generations have together contributed to an overwhelming perception of crisis being characterized by a particular combination of fiscal and monetary conditions, which in turn is the basis of the typical (IMF prescribed or otherwise) policy response to the situation. But is this perception consistent with the facts about crisis?

According to Frankel and Rose (1996), not entirely. They provide a working definition of currency crisis as follows: there is a nominal depreciation in the currency of at least 25 per cent, that is also an at least 10 per cent increase in the rate of depreciation in a short period of time. They study a sample of 105 countries over the period 1971–92. Based on their criterion, they identify 191 episodes of currency crisis. They analyse 117 of these by an event study approach, observing the behaviour of several variables for the three years preceding and following the event. The stylized facts emerging from their analysis are: crises tend to occur when foreign direct investment (FDI) inflows dry up; reserves are low; domestic credit growth is high; the real exchange rate shows overvaluation; northern interest rates rise; crises tend to be associated with sharp recessions, but the causality is unclear; and neither current account nor budget deficits appear to play an important role in a typical crash.

Some of these findings are in line with the theory, in the sense that they reflect the economy's inability to defend its exchange rate when it is under attack, as also its inability to mobilize long-term foreign exchange flows when it most needs them. Also, the high growth of domestic credit is in line with the notion that there is some pressure to expand liquidity in the economy. However, this does not typically seem to originate from the government, allowing for the possibility that shocks originating in the private sector may precipitate the crisis. The main implication of these findings is that while there may be a small set of common factors that characterize a crisis, these are more easily interpreted as associative than as causal. This is a distinction that overlaps with the distinction made here between proximate and structural. All crises may eventually manifest themselves in similar fashion, but this does not allow clear generalizations about the origins of the forces that bring about the crisis. There are simply too many differences between the conditions in crisis-manifesting countries to allow this. In order to understand the unfolding of a crisis in the context of a specific country, we have to explore the specific sources of instability and how they interact to bring about the crisis.

PERCEPTIONS OF THE EAST ASIAN CRISIS: A SELECTIVE OVERVIEW

Can We View East Asia Collectively?

In talking of growth performance, it has become conventional to talk about the East Asian experience in a collective way. There are obvious reasons for this, stemming from some basic similarities in how they went about achieving their rapid growth. Easterly (1995), in examining East Asian newly industrialized countries' (NICs) growth in an empirical growth framework, finds that the four NICs display large positive residuals in a variety of specifications. In other words, they grew more significantly than their initial conditions would have allowed us to predict. The fact that four of the highest positive residuals in the estimation are more or less neighbouring countries cannot be mere coincidence, in his view. He therefore suggests that there is some common process at work, an 'East Asian' factor, that allowed these economies to more effectively leverage their initial conditions into higher growth.

The commonality of their environment and strategic approaches (this time including the South East Asian countries) has been explored from different perspectives in Agrawal et al. (forthcoming). Even allowing for significant variations across countries, a generic 'East Asian' model is visible in terms of how these economies used their export sectors to leverage efficiency throughout their economies (Agrawal et al. forthcoming, Ch. 5). A large part of this story is their subordination of their financial systems to the overriding goal of export growth, again emphasizing that the degree to which this was done (and perhaps the effectiveness) varied from country to country. As I will argue subsequently, this link between the export sector and the financial system is a key to understanding the East Asian crisis. At this point, however, suffice it is to assert this position and use it to justify the collective reference to East Asia, rather than to individual countries. There were common strategies implemented, which resulted in certain common structural conditions, which contributed to the crisis. Therefore, taking a collective view of the crisis, *despite* the possibility of substantial differences across countries, is justifiable.

Dominant Western Perspectives

While a huge literature analysing the crisis has emerged in the West, the two most prominent economists associated with the effort are Paul Krugman and Jeffrey Sachs. Their views are well represented in Krugman (1998) and Radelet and Sachs (1998) respectively. There is a common focus in both their analyses on the problem of moral hazard as the underpinning of the crisis.[1] The moral hazard operated at two levels, domestic and international. In the domestic context, an inadequately regulated and supervised financial system, comprising both banks and non-banking financial companies, was overexposed in its lending to speculative activities such as construction and stock market investments. These were in violation of all common-sense prudential norms, but there was no mechanism in place to restrict their risky behaviour. This essentially happened because of what has come to be called 'crony capitalism'; the financial sector was captive to business interests which were close to the government, and were hence able influence the banks to finance their speculative activities. Banks may have been aware of the risks involved, but were powerless to stop this activity. Their capture resulted in lending decisions that would have resembled outcomes in the presence of moral hazard; i.e. if they were provided with the guarantee of a bail out.

At international level, the moral hazard influenced the behaviour of international commercial lenders. After the Mexican crisis of 1994, when the USA bailed out Mexico with an aid package aimed at ensuring repayment of short-term debt, there was a surge of short-term lending to the East Asian countries. Presumably, the lenders' assessment was that if an East Asian country defaulted, there would be some kind of international effort to bail them out. They were thus not particularly watchful of the kinds of avenues that the domestic financial system was investing these funds in.

The combination of exposure at the domestic and international levels was, in this view, the factor associated with the crisis. A series of bank failures in Thailand saw international lenders trying to pull out their funds. This put pressure on the exchange rate, which reserves were not sufficient to protect. Once banks began to withdraw funds from one country, the process soon spread to others. This in turn exposed the weak portfolios of the financial system in those economies, thus reinforcing the collapse.

The emphasis in this explanation is on what I would classify as proximate factors. It accurately describes and explains the mechanics of the unfolding crisis, but does not satisfactorily address the question that was posed in the introduction to this chapter: why did these otherwise successful economies get into a situation of such fragility? To address this question we have to look at the behaviour of structural factors.

Indian Perspectives

As might be expected, the East Asian crisis generated a lot of interest in India, most directly with reference to its own vulnerability to a similar crisis. Some analysts have focused on proximate financial factors. Goyal and Dash (1998), for example, examine the role of interest rate differentials in the massive outflows of short-term funds from the East Asian economies. Another perspective on this is with respect to the problems associated with inadequate development of domestic asset markets. This denies investors the opportunity to diversify their portfolios among domestic assets, and creates a strong link between the stock market and the foreign exchange market. In all the crisis economies, the currency depreciation was accompanied by a stock market collapse. While the opportunity for domestic portfolio diversification may not prevent a crisis if one were to precipitate, it might dilute the speculative build-up of equity prices because investors enter other asset markets as well. This may contribute to reducing volatility in the equity market, as well as weaken the link between the equity market and the foreign exchange market. Internal problems may therefore have less of a chance of precipitating a currency crisis in the external sense.[2]

However, there has also been emphasis on what I would classify as structural factors among Indian analysts. Rakshit, in a series of papers (Rakshit, 1997a; 1997b; 1998) points to the impact of a sharp decline in export performance on the financial sector of the crisis economies. In his view, several investments were undertaken on the basis of optimism about continuing high export growth. When this was not realized, the portfolios of financial institutions weakened, triggering off outflows of short-term debt. Bagchi (1998) provided a very detailed account of how the relationship between the real and financial sectors results in adverse selection problems—the foundations of the problem of crony capitalism.[3]

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[1] Moral Hazard refers to the incentives that people (or institutions) have to take risky actions, because they are not liable for the consequences of those actions. In the current context, international lenders may have had such an incentive because of the belief that the IMF or somebody else would bail out a borrower in distress. If their loans were thus protected, they would not hesitate to lend even to an economy on the brink of a crisis. For domestic lenders, the existence of moral hazard would lead them to lend to speculative activities with weak collateral, if they were sure that the government would bail them out in the event of failure.

[2] These views were expressed in a series of columns written for the *Business Standard* soon after the crisis precipitated. These are included in the references as Gokarn (1997b and 1997c).

In earlier comments on the crisis, I had again attributed the crisis to a number of structural factors:[4] the difficulty that South East Asian economies have had in transiting from a labour-intensive industrial structure in the face of rapidly rising wage costs; and the role of Japan in the region and the impact of its economic slowdown.

Also of relevance here, and related to Rakshit's argument, is the important disciplining effect that exports have had on the financial sector (Agrawal et al., forthcoming, Ch. 5) and the impact of export growth slowdown on the portfolio choices of the financial sector. One of the explanations for why banking supervision was so ineffective in these countries is precisely their success with exports. In effect, lending to exporters, whose performance was closely monitored by the government made it less necessary to monitor the banks directly. An effective institutional mechanism thus never had the opportunity to evolve.

Without diminishing the importance of each of these, and other contributions, it seems that what is lacking is a coherent story that puts all these different elements together. The next section puts together such a story.

INTEGRATING THE ROLE OF PROXIMATE AND STRUCTURAL FACTORS

The story proceeds as follows. First, the variables of concern are classified in Table 18.1. The behaviour of the variables represented in the proximate category is then examined. Since these are only financial variables, and their association with (or behaviour during) a crisis is intuitively obvious, it is a fairly simple task to examine them. Next attention is turned to the structural variables and the relationship between the real and financial sectors within the structural context is examined in some detail. This is the aspect of the crisis that, in my opinion, has not clearly emerged from current analyses. Finally, the links between the top and bottom of the table are highlighted.

By way of presentation, wherever possible, variables are shown for eight countries over the period 1992–7. For many variables, the data end in 1996. However, it is possible to build up a coherent story within the limitations of data availability. The starting point for the time series will be explained below. The eight countries are Thailand, Indonesia, Korea (the three 'crisis' countries), Malaysia, the Philippines, China, Taiwan, and India. Since this is a story of crisis, the discussion will be confined to a large extent to the first three countries.

Proximate Factors

The external aspects of vulnerability are relatively easy to measure. Table 18.2 reports the ratio of short-term debt to total external debt for the panel of countries from 1992–6. The Table provides another obvious measure of vulnerability, the ratio of short-term debt to international reserves. From the Table, the crisis countries as a group show relatively higher dependence on short-term debt than the others. The exception is Taiwan, for which this ratio is extremely high. However, Table 18.3 provides a more revealing picture of vulnerability; the three crisis countries uniformly have short-term liabilities equal to or more than their reserves. Taiwan's huge reserves allow it to do all its

TABLE 18.1
Classification of Factors/Variables

	Financial	Real
	Vulnerability to large outflows	
	1. Short-term debt	
Proximate	2. Importance of portfolio investment	
	3. Level of reserves	
	4. Weakness of domestic portfolios	
	Nature of the domestic financial system	*External factors*
	1. Institutions/mechanisms of supervision	1. The role of Japan
Structural	2. Opportunities for diversification	2. The role of China
		Internal factors
		1. Declining cost competitiveness

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[3] Adverse selection is the other side of the coin from moral hazard. The term is used to describe choices made by individuals (or institutions) operating under moral hazard. In this context, decisions of domestic banks to lend to speculative activities would be considered as adverse selection by the banks.

[4] These arguments were also put forward in a series of columns written for the *Business Standard*. These are included in the references as Gokarn (1997a, 1997b, and 1998).

TABLE 18.2

Ratio of Short-term Debt to Total External

(per cent)

Country	1992	1993	1994	1995	1996
Thailand	35.2	43.0	44.5	49.4	41.4
Indonesia	20.5	20.2	18.0	20.9	25.0
Korea	42.6	42.0	47.0	52.0	48.2
Malaysia	18.2	26.6	21.1	21.2	27.8
The Philippines	15.9	14.0	14.3	13.4	19.3
China	19.0	17.8	17.4	18.9	19.7
Taiwan	86.9	85.0	76.7	72.2	68.4
India	7.0	3.8	4.2	5.3	7.5

Source: World Bank (1998), for all countries except Korea and Taiwan. *Asian Development Bank* (1998) for Korea and Taiwan.

TABLE 18.3

Ratio of Short-term Debt to International Reserves

(per cent)

Country	1992	1993	1994	1995	1996
Thailand	69.4	88.9	96.5	111.2	97.4
Indonesia	157.9	143.8	146.4	174.3	165.7
Korea	147.4	137.4	156.7	180.5	159.5
Malaysia	20.2	24.7	23.5	29.4	39.7
The Philippines	98.6	84.8	80.2	68.1	68.0
China	55.4	55.9	30.3	27.8	22.7
Taiwan	21.0	23.6	21.8	21.6	31.1

Source: World Bank (1998), for all countries except Korea and Taiwan. *Asian Development Bank* (1998) for Korea and Taiwan.

borrowing short term, so from its viewpoint the first ratio is not really an accurate indicator of vulnerability. The point emerging from these two variables is that the crisis countries were vulnerable to a large outflow for quite some time, and it was not a sudden development.

Frankel and Rose (1996) have emphasized the role of FDI flows, and again it is intuitively obvious why this variable should be significant. It represents a committed source of foreign exchange. Of course, since the end of their sample period, portfolio investments (predominantly in the stock market) have become an important source of foreign funds, and these are appropriately viewed as skittish. High portfolio flows should be taken as an added indicator of vulnerability. Table 18.4 provides a comparative picture of direct and portfolio investment flows. From this panel, Korea (and Taiwan) are net investors abroad, so the FDI flow issue is only relevant to Thailand and Indonesia. In absolute terms, there was an increase in annual flows to these two countries in the years preceding the crisis. So the East Asian picture does not match with the stylized fact of Frankel and Rose. The simple fact emerging from these Tables is the growing importance of portfolio investments into all the panel countries. This can be taken, in a sense, as an indicator of external vulnerability. However, some other conditions need to be satisfied to make it effectively so. This issue will be addressed in the discussion on structural factors.

Overall, there is a clear picture of external vulnerability, particularly with respect to reserve positions in the crisis countries. Other countries also display weaknesses with respect to some indicators, but not all. We do have some means of distinguishing between countries on the collective basis of these indicators.

Domestic vulnerability is best represented by the quality of bank portfolios. A rather crude indicator of the expansion in financial intermediation activity is the growth rate of domestic credit. The assumption is that this is somehow related to the extent of bad loans/investments, which is a difficult assumption to validate. Nevertheless, the strong performance of this variable in the Frankel–Rose exercise gives some justification for using it in the proxy manner that it is here used.

TABLE 18.4
Foreign Direct and Portfolio Investment Flows

(US $ million)

Country		1992	1993	1994	1995	1996	1997
Thailand	Direct	2113	1804	1366	2068	2336	2354
	Portfolio	4	3117	–538	2154	1551	4451
Indonesia	Direct	1777	2004	2109	4348	7960	4525
	Portfolio	119	2452	3672	4873	3099	–2509
Korea	Direct	–433	–752	–1652	–1776	–2345	–1947
	Portfolio	5803	10,014	6120	11,591	15,185	14,763
Malaysia	Direct	5183	5006	4342	4132	4500	—
	Portfolio	385	3700	1320	2299	4353	—
The Philippines	Direct	228	1238	1591	1478	1408	1117
	Portfolio	333	1445	1407	1961	1333	–1027
China	Direct	11,156	27,515	33,787	35,849	40,180	
	Portfolio	1194	3818	3915	2807	3466	
Taiwan	Direct	–1088	–1694	–1265	–1424	–1979	–2974
	Portfolio	445	1067	905	493	–1112	–8283
India	Direct	277	550	973	2144	2587	—
	Portfolio	241	1840	4729	1517	4398	—

Source: Asian Development Bank (1998).

Table 18.5 reports this variable for the panel of countries. In the three crisis countries, in the year(s) preceding the crisis, the growth rate seems to have increased dramatically above the pattern of the previous few years. This pattern is not clearly seen in any of the other countries. This may simply be reflective of some endogeneity. However, there is substantial anecdotal evidence of 'bad' investments and lending policies of banks in these countries, so the correlation we are depending on for our explanation is likely to exist.

The final element in the proximate factors chapter is the behaviour of northern interest rates. As can be seen from Table 18.6, US interest rates of varying maturities bottomed out in 1993 and began rising steadily since then. However, their movements in the last couple of years of the series do not display any dramatic upward tendencies. The impact of this factor is more likely related to the increased risk premiums demanded of the East Asian countries than to movements in northern interest rates, as seems to have been the case in the Frankel–Rose exercise. Without much change in the absolute levels of northern interest rates, northern securities look more attractive as weaknesses in the Asian economies begin to manifest.

Structural Factors

Just to get the conventional wisdom out of the way, Tables 18.7 and 18.8 report on budget deficits and current account deficits respectively for the panel of countries. As Frankel and Rose found out, these are not

TABLE 18.5
Growth Rate of Domestic Credit

(per cent per year)

Country	1992	1993	1994	1995	1996	1997
Thailand	—	28.9	23.1	14.0	32.1	98.3
Indonesia	—	25.6	20.5	21.6	23.0	42.1
Korea	—	12.3	18.5	14.1	20.0	21.9
Malaysia	—	13.7	11.7	28.2	24.0	—
The Philippines	—	146.1	20.4	31.9	39.1	28.1
China	—	—	—	—	—	—
Taiwan	—	21.6	15.4	11.2	8.9	9.2
India	—	11.4	16.6	16.9	10.2	11.0

Source: IMF (1998).

TABLE 18.6
Interest Rates and Growth Rate of GDP

(per cent per year)

	US Interest Rates			Japan's growth rate of GDP
	T-bill rate	Government bond yields		
		Medium term	Long term	
1992	3.46	5.31	7.01	1.0
1993	3.02	4.44	5.82	0.3
1994	4.27	6.26	7.11	0.6
1995	5.51	6.26	6.58	1.8
1996	5.04	5.99	6.44	3.6
1997	5.07	6.10	6.35	−0.8

Source: Asian Development Bank (1997).

overwhelming factors in a crisis, and a glance at the numbers for the crisis countries reveals this, certainly with respect to budget deficits. The fiscal management of these economies has always been regarded as a very postive aspect of their performance, and clearly this did not fail them even as the crisis built up. This is not so clear with respect to current account; in the year preceding the crisis, the three countries did show noticeable increases in their deficits. However, this can be linked up with the next, and substantial, part of this story.

East Asian economies have been having problems with sustaining export growth in the last couple of years. There are a variety of factors responsible for this, and their impact varies from country to country. Some of

TABLE 18.7
Overall Budget Surplus/Deficit

(per cent of GDP)

Country	1992	1993	1994	1995	1996	1997
Thailand	2.6	1.9	2.7	3.0	0.9	—
Indonesia	−0.4	−0.4	0.2	−0.2	—	—
Korea	−0.7	0.6	0.3	0.6	0.3	—
Malaysia	−0.8	0.2	2.3	0.9	0.6	—
The Philippines	−1.2	−1.5	1.0	0.6	0.3	—
China	−1.0	−0.8	−1.2	−1.0	−0.2	—
Taiwan	−5.4	−3.9	−1.8	−1.1	−1.4	—
India	−5.7	−7.4	−6.1	−5.8	−5.0	—

Source: Asian Development Bank (1997).

TABLE 18.8
Current Account Balance

(per cent of GNP)

Country	1992	1993	1994	1995	1996	1997
Thailand	−5.8	−5.2	−5.8	−8.3	−8.1	—
Indonesia	−2.1	−1.4	−1.6	3.6	4.1	—
Korea	−1.3	0.3	−1.0	−1.8	−4.9	—
Malaysia	−3.9	4.6	−6.0	9.0	−6.3	—
The Philippines	−1.8	−5.5	−4.5	−3.3	−4.1	—
China	1.3	−1.9	1.3	0.2	0.3	—
Taiwan	3.8	3.0	2.5	1.8	3.7	—
India	−1.5	−0.6	−1.1	−1.8	−1.7	—

Source: IMF (1998).

them have already been referred to. Internally, rising wages, as a result of labour shortages and greater political freedom for labour organizations have been documented in some of these countries. This factor could conceivably have been neutralized by devaluing the exchange rate, but it is clear that these governments were typically averse to devaluation. The second generation currency crisis models referred to in an earlier section seem appropriate in this context.

External factors are also at work. Critical among these is the economic performance of Japan. Table 18.6 also reports on Japan's growth performance over the period. Obviously, apart from a brief recovery in between, this has been an extremely sluggish economy. Japan's role in the region is manifold: it is a policy role model, a big investor, a supplier of technology and inputs, a buyer, and also, from the viewpoint of mainly Korea and Taiwan, a competitor in many world markets. As Japan's economy has stagnated, I argue that its overall impetus to the East Asian economies in all these roles has weakened.

TABLE 18.9
Growth Rates of Merchandise Exports

(per cent per year)

Country	1992	1993	1994	1995	1996
Thailand	13.7	13.4	22.2	24.7	0.1
Indonesia	14.0	8.3	9.9	13.1	8.8
Korea	8.0	7.7	15.7	31.5	4.1
Malaysia	18.1	16.1	23.1	25.9	4.0
The Philippines	11.1	15.8	18.5	29.4	17.5
China	18.1	8.8	35.6	24.9	1.5
Taiwan	6.9	4.5	9.4	20.0	8.2
India	3.3	20.2	18.4	20.9	13.0

Source: Asian Development Bank (1997).

A second major external factor is China's increasing dominance of the world market in many of the commodities that these countries grew rich on. China devalued its currency in 1993, a step that should have had significant impact on the export potential of the other economies. This is why data has been presented here from 1992 onwards. Table 18.9 reports on annual growth rates of exports from the panel of countries. This is a bit misleading because it covers all merchandise exports, and the story here is founded on manufacturing exports. From this picture, the Chinese devaluation did not appear to have a significant immediate impact on the exports of the other countries. However, in 1996, all the countries, and particularly Korea and Thailand, experienced sharp drops in their export growth rates. China might have been expected to be picking up the slack, but it appears that China's exports also suffered in growth terms. China's share of exports from this region certainly went up over the period, but the story is clearly much more complicated than a simple shifting of market share.

There are caveats to this story, of course. One is that China's effective devaluation was much smaller than its official devaluation, since exporters had access to market sources of foreign exchange to begin with. So the devaluation may not have been as important a force in causing the East Asian export slowdown as it first appears. Second, Chinese exports also slowed down considerably. This might be attributed to problems with the data, but that is begging the question. So, while it is not quite certain whether there were one or two dominant causes of the East Asian export slowdown, the fact is that it did occur.

The link between the real sector and the financial sector in terms of structural factors is now introduced. The process is described in detail and analysed in Agrawal et al. (forthcoming). Historically, all these economies controlled the allocation of credit, whether or not they provided it at below market rates. The guiding principle for directed allocation of funds was export performance. In all these countries, access to (and sometimes the price of) credit was contingent on export performance. Of course, the magnitude and effectiveness of these directed credit programmes varied over time. The general point, however, is that to the extent that export success was an indicator of the efficiency of the enterprise, credit was being directed to relatively efficient sectors. Rapid growth of exports over the last two or three decades had put in place a reasonably sustainable relationship between the export sector and the financial system, without the necessity of developing a well-structured formal supervision mechanism.

In effect, export performance itself acted as a disciplining device on the financial system, because export performance was so closely monitored and scrutinized. As long as banks were lending a significant part of their funds either directly or indirectly to export activities, there was an implicit monitoring of their portfolios because the borrowers were themselves under direct supervision. The degree of supervision varied from country to country, of course, but it did exist in all of them. As long as this process was working, the need to evolve a well-structured and formal regulation and supervision mechanism was probably not felt.

As export potential started to decline, financial institutions were increasingly left to look for other lending avenues. This is where things started to go wrong. In an environment of relatively weak prudential supervision, bank portfolios were easily captured by political–commercial interests. They were able to retain the potential high returns of their risky investments, but were politically protected from the risk. This is the point at which crony capitalism comes into play. In our story, it is the result of the weakening of the disciplining effects of export performance on bank and finance company portfolios.

A second aspect to this story is that the relative success of the banking system did not necessitate the development of secondary markets for assets other than equity. Given their per capita incomes, these countries have had an inordinately high degree of dependence on the banking system for resource allocation. At one level, this accentuates the moral hazard problem, because there are no easily available methods for banks to hedge their portfolios (through securitization, for example), even if the regulator should insist that they do.[5] From this viewpoint, this is a problem endemic to all developing countries, so probably does not have a direct bearing on the East Asian crisis. However, at another level, the existence of secondary markets for debt instruments provides both domestic and international investors a domestic hedge against volatility in the equity market. Without this hedge, the only way that international investors in particular can hedge is through the currency market. In other words, exchange rates and stock market performance become closely related, as was seen in this crisis.

This is where the vulnerability introduced by large portfolio inflows becomes significant. There may be situations in which foreign portfolio investors feel the need to exit the country completely. In this situation, a currency crisis will be inevitable. However, there may be situations in which the stock market is weak without necessarily weakening the economy itself as an investment prospect. In such situations, the opportunity to diversify portfolios within the country dissociates stock market movements from currency movements.

Essentially, the development of widespread secondary markets achieves three things. It allows banks the opportunity to hedge their exposure. By doing this, it makes the task of the supervisor easier, because there is going to be a reasonable market evaluation of the bank's investment portfolio. And it reduces the inevitability of a currency crisis arising from domestic financial weaknesses.

Linking up the Components

The link between structural and proximate factors is now very straightforward. Large amounts of short-term debt and portfolio investment come into contact with inadequately supervised and non-hedgable financial institution portfolios. We have always had a reasonable explanation for why the foreign flows came in. We now have an explanation for why the domestic financial sector appeared to lose its moorings at the same time. This is not a story of inevitability; several things could have happened over the years preceding the crisis that would have reduced the probability of it happening. However, it is a story of inadequacy; inadequate supervision, inadequate opportunities for asset diversification, and inadequate incentives for project appraisal.

IMPLICATIONS FOR INDIA

The various vulnerability indicators show that India's vulnerability to a similar crisis is not very high at this point in time. In the last year, we have managed, fairly successfully, to either protect the value of the rupee or to ensure an 'orderly' decline. In terms of specific sources of vulnerability, however, the growing significance of portfolio investment flows obviously increases our exposure.

With respect to exports, India will never be as dependent on this source of aggregate demand as these economies were. This has two implications, leading in opposite directions. One, our financial sector allocated resources based on signals that did not have the built in incentives to efficiency that the East Asian economies did. As a result, we do have a serious problem with the quality of bank portfolios. The other is that, not being as vulnerable to structural changes in major markets and major competitors, slackening export performance in our case is not likely to have the same disruptive effect that we hypothesize it did in the East Asian context. Size does matter, although sometimes positively and sometimes negatively.

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[5] Hedging refers to offsetting or neutralizing the risk inherent in a particular asset by acquiring another asset, which has the opposite risk profile. An investor with many and relatively low cost hedging opportunities would be likely to construct a portfolio which would not be completely vulnerable to adverse developments in any one (or a few) of the asset markets. This would help in insulating the economy from such adverse developments, assuming they are confined to one, or a few, markets.

The most significant implication of this analysis in the Indian context is the overall problem of the quality of bank portfolios, and the inadequate opportunities that exist for hedging them.[6] In the East Asian case, this problem tied in neatly with external vulnerability to precipitate the crisis. In India's case, the failure of banks may not result in the same external manifestation, because we are not as vulnerable on the external front. However, the degree of internal dislocation that was caused in these economies, resulting in the prospect of negative growth for a few years, is certainly something we can do without.

In my opinion, the emphasis on interpreting this crisis from the Indian perspective should move away from the currency aspect and focus on the banking aspect. The East Asian crisis was structurally a banking crisis and proximately a currency crisis.

There has been a rethinking on the issue of capital account convertibility since the crisis precipitated. Mainstream opinion seems to have veered round to the view that it may not be as beneficial as was earlier believed; in other words, its disruptive potential may more than negate its allocative benefits. It is important to remember that *de facto* convertibility on capital account exists for foreign investors, so even without going to the extent of introducing it for citizens, its disruptive possibilities already exist. Even in the existing scenario, conditions have to be created to minimize these possibilities. This can be done by quickly creating domestic opportunities for portfolio diversification, as suggested by the Committee on Capital Account Convertibility (Reserve Bank of India, 1997), by widening and deepening the market for debt securities of all kinds.

To sum up, the main implication of the East Asian crisis for India is that it is better viewed as a banking than a currency crisis. In this context, India does manifest many of the weaknesses in its banking sector, although for different reasons, that the crisis economies manifested in theirs. Once this is recognized, the solutions in terms of strengthening domestic asset markets seem fairly clear.

CONCLUSIONS

In this chpater, the East Asian crisis has been analysed in terms of two sets of factors, proximate and structural. This approach allowed synthesizing of various explanations of the crisis into a unified story. The crisis was then seen as principally as emerging from structural factors relating mainly to the East Asian economies' export performance and proximate factors relating to the moral hazard problems faced by domestic and international financial intermediaries. The story of the crisis is therefore one of inadequate supervision, inadequate hedging opportunities, and inadequate ability of the banking system to develop project appraisal skills outside of export activity.

From India's viewpoint, the main lesson from the crisis comes from the ability to see it more as a banking and less a currency crisis. India does manifest many of the weaknesses that the crisis economies did with respect to their banking sector, although for different reasons. The solution appears to lie in rapid development of asset markets, which will allow banks to hedge their portfolios as well as give supervisors an additional bit of information about the quality of banks' portfolios.

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[6] The problems facing the Indian banking sector, with particular emphasis on the weaknesses in its loan portfolio, are extensively dealt with in Sarkar and Agrawal (1997).

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19

Privatization and Auctions

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INTRODUCTION

The last two decades have seen an almost black and white shift from state-owned enterprises to privatization all around the globe. During this period, the empirical evidence has tilted from being inconclusive towards the conclusion that private firms are more efficient than public ones in 'some' industries. However, economic theory still cannot predict the superiority of one over the other.[1] Be that as it may, thousands of public firms in various countries have gone private. During 1990–6, privatization revenues have totalled around US $ 155 billion. Of this, Sub-Saharan Africa's share is 3 per cent, East Asia and the Pacific rim account for 17 per cent, South Asia 5 per cent, the Middle East and North Africa 2 per cent, Europe and Central Asia 20 per cent, and Latin America and the Caribbean have contributed a massive 53 per cent (Liebermanand Kirkness, 1998).

Given these figures, we need to carefully look at the entire privatization process and see if there are any lessons to be learnt from the Indian point of view. In this chapter we attempt the task of focusing on the specific issue of how to privatize. While we do not subscribe to any unfounded and unsubstantiated beliefs (including the one that privatization is desirable for its own sake), we will not go into reasons for why not to privatize. We would urge the reader to look elsewhere for a discussion of the 'why' question.[2]

Of the privatization programmes during 1990–6, globally, telecommunications alone account for 24 per cent. Also, within a country the first enterprise to be privatized has often been the state-owned telecommunication utility. This is probably so because of this sector's crucial role in a country's infrastructure, the availability of modern technology, and the likely role of this sector as a catalyst in further liberalization.

In India too, good or bad, telecommunications liberalization policy has been centre stage. In May 1994, the Government of India decided to open the value added and basic telecom services to the private sector with the objective of maximum revenue generation from the auction of licences and provision of universal access to better quality telecom services at reasonable prices. Unfortunately, the Indian process has not been a smooth one. Lack of well-designed policy (or failure to implement it where one existed) and political indiscretion together with lack of proper regulatory mechanism has led to the withdrawal of many potential players from bidding for licences. Even *ex post*, the telecommunications process continues to be riddled with controversies. Hence, in this chapter, we use telecommunication liberalization the world over, and in particular the Indian experience, as the touchstone for our discussion.

A remark regarding terminology first. There is a subtle difference between the concepts of privatization and liberalization. While the former refers to change of ownership the latter is often used to suggest change of market structure. In practice, however, the term *privatization* is used in a much wider sense to cover several distinct relationships between the government and the private sector such as de-nationalization (sale of public assets), deregulation (introduction of competition

Acknowledgements: We are grateful to Kirit Parikh for his comments.

[1] Compare Boardman and Vining (1989) with the more recent empirical appraisals of Megginson, Nash, and van Randerborgh (1994) and Porta and Lopez-de-Silanes (1997).

[2] See Tirole (1991) and Schmidt (1996) for a balanced perspective. For a scary as well as witty appraisal of the current Russian 'Titanic' experience, see Tolstaya (1998).

into regulated sectors), and contracting out (franchising to private firms of state financed goods and services) (Kay and Thompson, 1986).

This chapter is organized as follows. In the next section, we quickly recount the global privatization scenario. The third section briefly outlines different mechanisms available for privatization and narrows the choice to that of auctions. In the forth section, we present three basic auction forms and evaluate them in situations where the basic operating assumptions might fail. While the fifth section recounts the liberalization procedures of the Indian telecommunications sector, the next section critically analyses them. Next, we discuss the US spectrum auction form which may yield valuable lessons for future privatization exercises. The final section concludes the article with a few remarks.

PRIVATIZATION: THE GLOBAL SCENE

Widespread privatization of state-owned enterprises has been a common phenomenon in both developing as well as developed economies in recent years. The scale and speed of privatization can be judged from the fact that in the emerging markets revenue from privatization has grown dramatically over the past ten years, from just over $ 2 billion in 1988 to $ 25 billion in 1996. Table 19.1 gives the sectorwise revenue generated globally from privatization in emerging markets from 1990 to 1996.

TABLE 19.1

Global Privatization Revenues by Sector 1990–6

(US $ million)

Sector	1990	1991	1992	1993	1994	1995	1996	Total
Infrastructure	9704	6863	9715	5360	9399	9240	15,201	65,481
Industry	1402	5558	7188	7491	6091	5787	3546	37,063
Agriculture and mining	1367	3608	3394	6215	4068	4336	2787	25,776
Financial services	47	7793	5263	3411	1065	1933	2671	22,182
Other services	138	420	621	1184	1088	606	1108	5165
Total	12,658	24,242	26,181	23,661	21,712	21,901	25,313	155,667

Source: Liberman and Fergusson (1998).

The reasons for the current spurt in privatization have been many (Lieberman and Kirkness, 1998). To outline a few, in the aftermath of the external debt crisis of the early 1980s and the ensuing years of macroeconomic stability and economic adjustment, many developing countries found it difficult to absorb the fiscal burden of state enterprises. The astounding economic performance of the East Asian countries (with their heavy reliance on outward oriented policies and the private sector) mesmerized many.[3] There was also the major collapse of alternative models of economic development, such as central planning in East Europe, Vietnam and China, and other import substitution models of much of Latin America.

In addition, the rapid development of information technologies such as telecommunications, computers, microelectronics, robotics, fibre optics, and advanced and composite materials intensified the competition in global markets. In this world of rapidly evolving technology, the public firms failed to keep pace, as their decisions were often politicized and their responses to changing markets and technology were sluggish. Also, in many economies state enterprises were overstaffed and depended largely on subsidies and unilateral budget transfers for financial support. As these enterprises were often important suppliers of goods and services to the private sector, their poor performance in turn affected the performance of private firms, particularly in protected markets.

Therefore, while the developed countries undertook privatization to promote competition, which would lead to an increase in efficiency, lower the cost, and raise the quality of goods and services, the developing countries had other major objectives. First, they tried to generate new sources of cash flow and finance for enterprises in both domestic and foreign markets. Second, they tried to reduce governments' fiscal deficit by using privatization revenues to retire external and domestic debt, reducing fiscal transfers to state enterprises and increasing tax revenues through higher profits generated by privatized enterprises.

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[3] See chapter 18 in this volume for an analysis of the current East Asian crisis.

METHODS OF PRIVATIZATION

If for the above reasons, a government wants to privatize its state-owned enterprises, how should it do so? If there is more than one method, which one would lead to an efficient allocation of ownership rights as well as generate maximum revenues? The methods of privatization followed by countries all over the world can broadly be classified into four categories.

Natural restitution: Natural Restitution is the restitution of property expropriated by the state to its original owner. Restitution has primarily involved agricultural land and also real estate such as houses, shops, restaurants, and other small properties, factories and mines. This method can only be used when the former owners exist and can demonstrate their ownership. The extent of privatization through restitution is determined to a large extent by past history (how easily can previous owners be located) and in part by political decisions about which acts of expropriation are to be redressed and which former owners are to be compensated.

Mass or voucher privatization: In a programme of mass privatization, eligible citizens use vouchers, distributed either free or bought at nominal price, to bid for shares of state-owned enterprises. Vouchers, in effect, create a stock of savings that matches the stock of state assets being privatized. Now, people can either be direct shareholders or in turn can allocate some or all of their vouchers to private mutual funds who would then bid for shares on behalf of their investors (Brada, 1996). Most of the eastern and central European countries have implemented different variations of voucher privatization schemes.

Sale or auction of state property: In cases where no former owner exists, the method of privatization widely used is to sell or auction these properties. The shares of a public firm could be offered to managers and workers of the firm at a preferential rate. The auction of state property is intended to meet several goals such as producing revenue for the state, hastening the process of restructuring the firm, and enabling foreign investors' involvement in the economy.

Participation contract: An alternative to auction is the participation contract where the government, instead of receiving cash payment, retains a sleeping fractional ownership in the firm which entitles it to receive a certain percentage of all future profits. In effect, applying the participation contract is the same as the government using its auction revenue to provide the firm with an equity endowment in exchange for ownership shares.

There are two other methods which are not so widely used, viz. *bargaining* and *give-away*. In a bargaining scenario, the government selects an eligible operator and bargains with him/her on the terms of provision of the product or service or revenue to the government. One might expect that a government with all its bargaining power might be able to do better than an auction. But Bulow and Klemperer (1996) have shown that an auction with more than two bidders would generate more revenue than bargaining (even when the government has a strong bargaining position). As opposed to bargaining, competent investors receive the firm as a gift in a give-away. For example, in the privatization carried out by German Treuhand, the central privatization agency of East Germany, East German firms were sold to West German investors for a single symbolic Deutschmark. Given the limited applicability, we would not include these two methods of privatization in our ensuing comparison.

A comparison of the above methods of privatization shows that natural restitution is time consuming and prohibitively complicated. Voucher schemes lead to too widespread an ownership and diffused control.[4] Hence many countries prefer either auctions or participation contracts to privatize their state enterprises.

But participation contracts, which possess many interesting theoretical properties such as risk sharing, information revelation, and incentives, do not perform well when transplanted in a partially or fully government-controlled setting.[5] It is so because: (i) managers continue to manipulate the performance targets to their advantage (for example, in their field interviews related to the National Thermal Power Corporation of India [NTPC], Shirley and Xu [1998] found that negotiations on targets were so prolonged that the targets set were ultimately the same as actual performance); (ii) the incentives given are too low powered; (iii) the governments fail to keep their commitments (for example, state electricity boards routinely fail to pay the NTPC as has been contractually agreed upon); and (iv) there is no neutral third party enforcement which is free of politics.

Auctions, on the other hand, are familiar and simple to use. They are, in particular, very useful in a situation where the government is uncertain about the buyers' valuations of how productive the enterprise being sold would be under their control, as is often the case. In a situation where the government cannot with any confidence fix a price, an auction mechanism endogenously generates the sale price. Due to the inherent properties (to be recounted later), auctions often succeed in forcing buyers to compete against each other and thereby make sure that the enterprise goes to one who most values it and generates revenue.

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[4] See Tirole (1991) for a balanced assessment.

[5] For an illuminating case study of such contracts, see Shirley and Xu (1998).

According to Demougin and Sinn (1994), the auction method is, however, not without its problems. It can absorb funds which the credit-constrained investor could have directly borrowed for restructuring purposes. It also raises the market rate of interest when the government uses the sales revenue for the purchase of goods and services rather than reinvestment in the capital market. Also, a public firm not exposed to market forces might encounter many unprecedented and unknown difficulties; hence many potential investors may be hesitant to participate in the risky auction programme and even if they do so, they may bet only moderate stakes.

While these arguments may be true for transitional economies, we argue that they do not hold good in a well-functioning market economy with developed capital and risk markets. If the firm to be privatized is profitable, bidders can easily raise the cash needed to pay the government and they can also find insurance in the risk markets. For example, they can raise the funds needed and transfer the risk involved to others by reselling all or part of the privatized firm in the stock market.

We would henceforth focus only on auctions. Also, from now on, for ease of reference we are only going to talk about auctioning telecommunication licences. But the reader should be aware that the methods to be discussed are equally applicable to the sale of any state-owned enterprise or object.

AUCTION FORMS

There are many different auction forms available. These forms differ widely in terms of both efficiency and revenue generation capabilities. In this section, we discuss only three basic auction forms and hope to convince the reader that our choice is optimal as far as applications are concerned as well as for building more complex auction forms (such as the US spectrum auctions) later on.

Most of us would be familiar with the 'English auction' (also known as oral, open, or ascending bid auction) form, at least in the movies if not in real life. The auctioneer calls out successively increasing prices beginning from a reservation price. The bidders can withdraw from the auction at any time and once withdrawn, they cannot re-enter. The auctioneer continues until there is only one bidder and she pays the price at which the second highest bidder dropped out. The important characteristic of this auction format is that everyone knows who dropped out at what price and the winner pays the second highest bid. Also, the English auction as defined here differs from the 'movie' ascending bid auction in one crucial aspect, viz. the winner here pays not her own final winning bid but the second highest bid.

Those of us who are familiar with procurement contracts would have come across a variant of the 'first price sealed bid auction'. Here, all the bidders submit sealed bids and the one who submits the highest wins and pays whatever she has bid.

William Vickrey (1995 Nobel Prize winner in Economics) proposed another auction form in 1961, viz. 'second price sealed bid auction' (also known as Vickrey auction). This auction form is similar to the first price auction form except for one crucial detail. The winner here pays the second highest bid instead of her own. This auction form, though not used in practice (see Box 1 for an exception), displays some interesting theoretical properties. These are partly explored in the following subsection.[6]

We do have a 'descending bid auction' form (more popularly known as 'Dutch auction') where an auctioneer calls an initial high price and then continues to lower it until a bidder is willing to buy at the going price. Observe that this auction form is similar to the first price sealed bid auction where the bidder does not get to know others' bids and pays the full amount of her own bid. Following this equivalence between Dutch auction and first price auction (observed first by Vickrey), we can ignore the Dutch auction in the ensuing discussion.

Choice of an auction form

The choice of a specific auction form from among the above three would depend on the specific circumstances faced by an auctioneer. Suppose now that an auctioneer has strong reason to believe that the following would in general hold good: (i) *risk neutrality*: all the bidders are risk neutral, (ii) *symmetry:* the bidders do not differ much in those characteristics which are likely to induce variations in their *ex ante* valuations, and (iii) *independent private values:* a bidder's valuation does not depend on others' valuations and hence a third party cannot infer anything about one's bid from that of another.

Vickrey concluded that if all these three conditions hold good, then *all the three basic auction forms would allocate the licence to the bidder with the highest valuation (efficiency) and generate the same expected revenues for the government (revenue equivalence).* In other words, a government can choose any one of the three auction forms, provided risk neutrality, symmetry, and independence of valuations hold good.

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[6] For a more detailed discussion, we refer the interested reader to Bulow and Roberts (1989). Milgrom (1989) is a highly readable rendition of basic auction theory. For more thorough surveys on auctions, we refer the reader to McAfee and McMillan (1987) and Wilson (1992). Apart from these surveys, this section also relies on Maskin (1992) and Schmidt and Schnitzer (1996).

Before exploring the intuition behind Vickrey's result, we note that most of the strategic models take into account the fact that some bidders might misrepresent their true valuations for a licence. Imagine yourself in a price haggling situation. You would be a poor bargainer if you quoted your true willingness to pay right away (you might if you were impatient). The same phenomenon can be observed in auction markets as well. A typical bidder would start way below her valuation and would quit when others' bids exceeded her valuation. Hence the crux of the auction design lies in making bidders reveal their 'true' valuations.

In the English auction, note that it is in the bidder's interest to drop out as soon as the going bid exceeds her valuation. Vickrey's auction is similar to the English auction in requiring the winner to pay the second highest bid. Hence the bid here does not affect the price which the bidder has to pay but only her chances of getting the licence. In both these auction forms, telling the truth is good for the bidders. Why? If she bids less than what she truly values the licence being auctioned and still wins, she could as well have bid her true valuation. If she did not win, then there is a possibility that the winning bid could lie between her bid and her valuation, in which case she would have been better off revealing her valuation. If she bids more than her valuation and does not win, she could as well have bid her valuation. But if she wins, then it is quite likely that the second highest bid lies between her valuation and her winning bid, in which case she would have been better off sticking to her valuation.

As opposed to this logic, in the first price auction, it may not be optimal for the bidder to bid her true valuation. But, while submitting a lower bid than her valuation, the bidder has to make a trade-off between maximizing her rent (viz. the difference between her valuation and the winning bid) and chances of her winning the auction (smaller the bid, smaller is the chance of winning). After some more involved game theoretic reasoning (from exposition of which we desist), one can actually show that this auction form too is efficient.

We do not want to say much about the second part of Vickrey's insight, viz. the expected revenue would be equivalent between these three auction forms, except to alert the reader that the operative word is 'expected' (in a probabilistic sense). For any specific realization, the first and second price auctions would differ in terms of the actual revenue they generate.

There is a difference, however, between the statements 'expected revenues would be the same' and 'maximum revenue is generated'. Consider, for example, the Vickrey auction. Here the winner pays not her true valuation but the second highest bid. The difference between the true valuation and the second highest bid is the 'information rent' which the auctioneer has to pay to induce the bidders to reveal their true valuations. The same is true for the English auction. We have already noted that in the first price auction there is a trade-off between shading one's bid and probability of winning the licence, which would stop us from obtaining maximum revenue.

However, if our three conditions hold good, an English auction with a reserve price for the licences would maximize revenues. Also, note that the revenue maximizing auction need not be efficient as there is a possibility that a licence may not be sold at all (in the case of winning bid being lower than reserve price).

Arguably, the simpler the rules of the auctions, the easier they are to implement. All the above three auction forms would pass such a test. But the perceptions of the auctioneer concerning the bidders (viz. risk neutrality, symmetry, and independent private values) which underlie these three auction forms may not be true in many situations. We want to point out that revenue maximizing auctions in such situations would be quite complicated and not robust to small changes.

To quickly summarize, under our three basic assumptions, all the three auction forms are equivalent. However, in many real world situations we may have to impose reserve prices. In such situations, the English auction with reservation price would emerge as a marginal winner.

Violation of Basic Assumptions

Let us now turn to the fine print and explore what the violation of each condition would lead us to. Suppose that risk neutrality is violated; that is all or some of the bidders are risk averse. This manifests itself as risk of not winning the licence and if won, the risk associated with the use of that licence (viz. the future uncertain stream of payoffs from it). In this case, again all the three auction forms continue to be efficient; but the first price auction is likely to yield a higher expected revenue.

What happens if bidders are not symmetric? If bidders are asymmetric (for example consider the case where a foreign bidder is interested only in licences to operate in metropolitan cities), then expected revenues can potentially be increased by some amount of discrimination against bidders with very high valuations. But the discrimination strategy should be chosen very carefully; otherwise the bidder with the high valuation may not participate at all, causing the outcome to be inefficient.

What if the bidders' valuations are correlated? Here one might witness what is known as 'winner's curse'; in both the first and second price auction forms, the winner would realize that she has overestimated the true value of the licence. This curse manifests itself in relatively aggressive bidding of the inexperienced bidders. On the other hand, the skilled participants would take this curse into account and would bid more conservatively, compared to an independent private valuation case. The English auction is unaffected by correlated values (because the additional information revealed by those bidders who drop out enables one to reevaluate her valuation and hence nullifies the curse).

Is it possible for the bidders to collude? The answer is yes for the English and the second price auctions. Even if one agrees to collude but then tries to renege on the collusive agreement, she could potentially be punished by others (through their bids of course). Such collusion is difficult to sustain in the first price auction though (because of the sealed bids), as one can renege by bidding slightly above the collusive bid. While collusion is bad from the revenue-maximizing viewpoint, it does not affect the efficiency properties of any of these auction forms, in that the licence still goes to one who values it most.

What happens when there are multiple item auctions characterized by complementarities? There could be a sale of many licences at the same time as in the case of telecommunications. For example, it might be optimal for a telecommunications operator to win licences in adjacent geographical areas. If these licences are sold separately in a sealed bid auction, a buyer can end up winning only a small portion of her desired operating area, which may not be worth much. This might result in reduced revenues as well as undesirable ownership or network patterns. Hence a desirable auction format should allow for such complementarities or aggregations. Obviously then our simple auction forms have to be somewhat modified. We have more to say about this issue in the seventh section where we discuss the US experience in spectrum auctions.

Taking all the above finer details into consideration, we conclude that governments involved in privatization exercises using auctions should prefer the English (ascending bid) auction form. With this albeit brief knowledge of the basic auction forms, let us explore how the Government of India fared in its telecommunications liberalization exercise.

PRIVATE ENTRY IN INDIAN TELECOMMUNICATIONS

Telecommunications was unfortunately not perceived as one of the key infrastructures for rapid economic development during the formative years of the Indian economy. The persistent low level of investment and low priority given to telecommunications adversely affected the sector in terms of quantity, quality, and range of services provided. In 1996, the Indian telephone density per 100 persons was 1.3 whereas the world average was 1·1 (Nair, 1996). At the same time with increased integration of Indian markets with world markets, the demand for the quantity and range of communication services increased substantially. Therefore, in order to ensure universal access to telecommunications services of world class quality and at reasonable price the Government of India decided to liberalize the value added and basic telecommunications services in May 1994.

The following subsection discusses the process of private entry in the value added and basic services in the Indian telecommunications sector.[7]

Value Added Services

For cellular mobile telephone services, licences were allotted to private firms in two stages. In the first stage, only the four metro cities, i.e. Mumbai, Delhi, Chennai, and Calcutta were opened for private firms. The policy was to allow two players in each city with a licence period of ten years. The selection was done on the basis of open tenders, where the government announced the licence fees beforehand and private firms competed for concessions to the consumers in terms of rental charges. Accordingly, eight companies were issued licences in November 1994 for providing cellular mobile phone services in the four metropolitan cities.

In the second stage of bidding, the rest of the country was divided into nineteen circles for which the government floated tenders on 31 December 1994. The nineteen circles were further divided into three categories A, B, and C in diminishing order of attractiveness.[8] Two highest bidders were to be granted licences in each circle subject to the condition that the second highest bidder agrees to match the bid of the highest bidder. Some of the eligibility conditions for bidders were the following: (1) the bidder must be an Indian company registered before the date of submission of the bid; (2) total foreign equity in the bidding company must not exceed 49 per cent of total equity; and (3) net worth of the bidder should not be less than Rs1000 million, Rs 500 million, and Rs 300 million respectively for category A, B, and C circles.

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[7] In what follows, DoT stands for 'Department of Telecommunications, Government of India'.

[8] Category A included Andhra Pradesh, Gujarat, Karnataka, Maharashtra. and Tamil Nadu. Category B consisted of Harayana, Kerala, Madhya Pradesh, Punjab, Rajasthan, Uttar Pradesh, and West Bengal. Assam, Bihar, Himachal Pradesh, Orissa, and the North East together formed category C.

However, afterwards the Communication Ministry decided to restrict the monopoly power of each bidder and subsequently announced that only three licences would be allotted to any one bidding consortium in the circles falling under categories A and B. This resulted in some circles being vacated by the winners as they had already won three circles. Since the second highest bidder failed to match the winning bid in the vacated circles, as per the requirements of the capping rule, there was re-bidding in many circles.

Financial bids for radio paging services were invited for twenty-seven circles for a licence period of ten years. But some of the highest bidders failed to provide the bank guarantees within the stipulated time. As the second highest bidders also refused to match the highest bid, only in eight circles was the licence agreement signed and there was re-bidding in the rest. However, by June 1995, private firms were operational in 25 out of 27 cities.

For all other value added services, licences were granted as per fixed licence fees, on fulfilment of certain eligibility criteria.

Basic Telecom Services

For the provision of basic telecommunications services, the entire country, excluding the Mahanagar Telephone Nigam Limited (MTNL) operating areas (viz. Delhi and Mumbai), was divided into twenty-one telecommunications circles. In January 1995, the government invited tenders for all the circles except Jammu and Kashmir. In each circle, one private firm was to be given licence for a period of fifteen years along with DoT. The private firms were allowed to provide local services and subscriber trunk dialling (STD) services within the circle along with the value added services except radio paging and cellular mobile phone services. The inter-circle STD services were to be the monopoly of DoT and the international services were to remain with Videsh Sanchar Nigam Limited (VSNL).

The eligibility conditions of the bidders were almost the same as in the case of cellular telephone services. However, the bidding company was also required to have the experience of operating 500,000 lines as on 1 January 1995, a condition which forced the private firms in India into joint ventures with foreign telecommunication firms. The winners were also required to provide a minimum of 10 per cent of the lines in rural areas. In the evaluation of bids, the licence fee payable to DoT got maximum weightage of 72 per cent, the network roll-out plan for the first three years got a weightage of 10 per cent, percentage of these lines in rural areas got 15 per cent, while use of indigenous equipment got 3 per cent weightage.

The bidding procedure started among widespread scepticism and confusion. Although the Communication Ministry had proposed the separation of the operation and regulation functions of DoT and setting up of the Telecom Regulatory Authority of India (TRAI) in order to create a level playing field between DoT and private operators, in reality it was nowhere in sight. The lack of transparency and the fact that bidding was conducted by DoT which was also a competitor in each circle led to widespread uncertainty resulting in the withdrawal of many potential bidders from competition.

However, the outcome of the auction came as a big surprise to both bidders and government. One company, Himachal Futuristic Communications Ltd (HFCL) bid a substantial Rs 850,000 million for nine telecom circles which was much higher than the second highest bid in each circle. Following the almost monopoly position of HFCL, DoT belatedly announced a cap of three circles in categories A and B per bidder. Although the cap was defended by the Communications Minister using the monopoly argument, it was alleged that the government bailed out HFCL by imposing this cap. Further, HFCL was allowed to keep any three circles instead of the highest bid circles as was the policy in case of cellular mobile phones. As the difference between the first and second highest bids was very high, the firms in the second position failed to match the winning bid. This was followed by of DoT's surprising decision to reject the highest bids for ten circles on the grounds that they were below the reserve price. Neither the reserve price nor the method of calculating it was declared before the bidding procedure. In December 1995, companies that failed to get the licence to operate, moved the Supreme Court challenging the modalities of approving the basic service tenders which was subsequently dismissed by the Supreme Court in February 1996.

DoT announced re-bidding in thirteen telecom circles in December 1995, of which only five circles attracted bids and that too from only six firms. Subsequently, the government included Jammu & Kashmir as one of the circles, reduced the reserve prices substantially, and announced a third round of bidding for nine circles. This also proved to be a disaster with only Bharati Telecom applying for the Madhya Pradesh circle. So even after many years of the start of the private entry process and three rounds of bidding, India is still left with eight of the twenty-one circles without any takers. Tables 19.2, 19.3 and 19.4 give the circle-wise highest bidders in each round of auction in basic services and the corresponding reserve prices. A fifteen-year horizon is used for the net present value calculations in Tables 19.3 and 19.4.

TABLE 19.2

Circle-wise Highest Bidders in Basic Telecommunications

Highest bidder		Telecom circles Bid amount (Rs million)
Andhra Pradesh**	HFC Bezeq	153,650
Delhi	HFC Bezeq	150,850
Gujarat**	HFC Bezeq	150,850
Maharastra	Hughes Ispat	139,090
Kerala**	HFC Bezeq	95,550
West Bengal**	HFC Bezeq	90,650
Punjab**	HFC Bezeq	90,650
Uttar Pradesh (W)	HFC Bezeq	65,800
Karnataka	Huges Ispat	57,960
Tamil Nadu*	BPL US West	45,200
Haryana	HFC Bezeq	40,600
Orissa	HFC Bezeq	20,650
Rajasthan	Telelink Network	11,100
Bihar*	Techno Teleservic	2440
Madhya Pradesh*	Reliance Nynex	294
Uttar Pradesh (E)	Reliance Nynex	137
North East States	Reliance Nynex	44
Assam*	Reliance Nynex	44
Andaman & Nicobar	Techno Teleservic	33
Himachal Pradesh*	Reliance Nynex	18

Notes: * Bids rejected by DoT.
** Circles left because of cap.

Source: Infrastructure in India, CMIE, 1996.

TABLE 19.3

Circle-wise Reserve Price and Bids for Second Round

(Rs million)

Telecom circles	Reserve Price	Bidder	NPV of quotes
Andhra Pradesh	12,500	Tata Tel.	13,030
Gujarat	10,500	Reliance	10,530
Tamil Nadu	25,500	Basic Tel.	36,050
Bihar	1400	Techno Tel.	1410
Punjab	12,700	(1) Essar Corpn	14,250
		(2) Bharati Tele.	13,680
Kerala	22,000		
Madhya Pradesh	2500		
Uttar Pradesh(E)	5400		
West Bengal	11,800		
Andaman & Nicobar	200		
Assam	700		
Himachal Pradesh	800		
North East	300		

Source: Infrastructure in India, CMIE, 1996.

TABLE 19.4

Circle-wise Reserve Price and Bids for Third Round

(Rs million)

Telecom circles	Revised Reserve Price	Bidder	NPV of quotes
Kerala	15,830		
Madhya Pradesh	2010	Bharati Telnet	2530
Uttar Pradesh (E)	3880		
West Bengal	9860		
Andaman & Nicobar	150		
Assam	680		
Himachal Pradesh	630		
North East	270		
Jammu & Kashmir*	460		

Note: * Circle introduced for auction in the third round.

Source: Infrastructure in India, CMIE, 1996.

The next section undertakes a critical analysis of the auction mechanism adopted for value added and basic communications services interspersed with the necessary comparisons with the experience of other countries that have been leaders in the privatization of the telecommunications sector.

ANALYSIS OF THE AUCTION MECHANISM IN THE INDIAN TELECOMMUNICATIONS SECTOR

Two decisions which are at the root of the chaos in Indian telecommnications liberalization are: (i) the decision of the government to *ex-post* declare a cap of 3 circles per bidder after a single firm, HFCL, had won 9 out of 20 circles and (ii) the decision of the government to reject the highest bid on ten telecom circles on the grounds that they are below the reserve price. These two decisions led to multiple rounds of bidding.

So far as restricting the number of circles to be allotted to a single firm is concerned, one has to take into account the fact that the cost of providing telecom services in more than one circle by one firm will to some extent be sub-additive.[9] As a result, the value of these telecom services will be super additive to the buyer and the allotment of more than one circle to a single player will definitely raise the revenue of the seller. But this, in turn, will result in defeat of the sole purpose of liberalization, viz. creation of competition. There would be another monopoly along with DoT which would result in subsequent loss of social welfare. Thus a trade-off has to be made between reaping the benefits of economies of scale and scope and loss of social welfare, and hence a restriction has to be put on the number of circles to be allotted to a single firm. However, this cap should have been announced at the beginning of the auction procedure itself, so that the bidders would have been more aggressive to ensure the win of at least one circle and the government would have generated more revenue.

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[9] This implies, the total cost of providing services in two circles by the same firm will be less than or equal to the sum of the cost of two different players in those two circles due to economies of scale.

Another factor identified by us earlier, which plays an important role in the success of an auction mechanism, is the announcement of an appropriate reservation price. It signals the value of the circle to be auctioned and helps the bidders in their own evaluation. The importance of reserve price is further evidenced by the New Zealand experience recounted in Box 1).

Box 1

Auction Design Matters!

The government needs to pay close attention to the design aspects of the auction. This fact is brought out forcefully by the New Zealand (NZ) and Australian experiences. In 1990, NZ auctioned the spectrum for radio, television, and cellular phone companies using second price auction. One company that bid NZ $ 100,000 paid the second highest bid of NZ $ 6. An Otago university student bid NZ $ 1 for a television licence in a small city and paid nothing as no one else bid. Had the auction designers paid heed to what theory says, viz. impose reserve prices whenever there are very few bidders, they would have improved upon the revenue generated (which was one-seventh of the original estimate) and avoided the political embarrassment that followed.

What followed in Australia in 1993 during an auction of satellite television services is even more hilarious. The government used the first price auction method and the licences were won by two unknown companies whose winning bids were around A $ 200 million. These companies promptly defaulted their bids (as the government forgot to include default penalties). It turned out that they had also put in a series of lower bids (20 descending bids at the interval of A $ 5 million each) and they continued to default over a year and finally paid roughly A $ 100 million. As an added measure, they later sold the license to another firm for a profit of roughly A $ 20 million!

Moral of the lesson: Governments should learn to print the 'fine print'!

Source: McMillan (1994).

Therefore, the Indian government should have declared reserve prices before the start of the auction so that the bidders would have had some idea about the expected price and the government would not have had to go in for a second and consequently a third round of auction. The fact that the government used the valuation of the bidders in each round of auction as an input in deciding the reserve price for the next round, is probably the major factor responsible for the fall in the bids in the second and third rounds. It is most likely that the firms formed a cartel and bid less so that the government was forced to lower the reserve price in each subsequent round. Another factor that points to collusion among bidders is the fact that out of five circles that received bids in the second round of auctioning, four had single bidders and the bid amount was very close to the reserve price set by the government in each circle (see Table 19.3).

The falling bids in the second and third rounds may also be due to the 'afternoon effect' or the 'price-decline anomaly'. Economic theory shows that if identical objects are offered to risk averse buyers in a sequence of bids, the bids in the second and consequent rounds of bidding are more likely to decline than to increase. This phenomenon is known as 'afternoon effect' or 'price-decline anomaly'. An example is the 23 June 1990 sale of fine wines using English auction at Christie's of Chicago, where, out of 1355 total lots, the sale of a wine was followed immediately by an offering of an identical wine 119 times. A definite pattern was found in the price of the wine auctioned sequentially. Wine sold at latter periods more frequently fetched a lower price than the price of the identical wine sold in earlier periods (McAfee and Vincent, 1993).

Exploring the possibility of 'afternoon effect' in the Indian auctioning of telecom licences, one can see that almost all of the bidders are without any experience in the provision of basic services in India. So in the first round of auction they were willing to pay a premium over their estimated price to avoid the risk of loss. But in subsequent rounds, with declining risk aversion (as information is revealed on expected valuation by some players), the bids declined. A possible way out of this could have been to place a reservation price in the second round at least as high as the second highest bid in the first round of auction to stop prices from falling. The highest and defaulting bidder of the first round should have been asked to pay the difference between the two highest prices as a penalty to save DoT from possible revenue loss.

Another interesting feature of the outcome of the current auction of Indian telecom circles is the substantial over-bidding by a single firm, HFCL, much above the bid of the second highest bidder. This shows that the auction mechanism did not provide sufficient safeguards against winner's curse, where the highest bidder finds that he has highly overestimated the value of the object and has to pay more than it is actually worth and cannot escape unaffected. Winner's curse also results in underestimation by some of the bidders. When bidding involves substantial amounts, in a sealed bid auction, the fear of winner's curse makes bidders very cautious. This is evident from the fact that in five circles, viz. Assam, Himachal Pradesh, Madhya Pradesh, Uttar Pradesh (east), and the North East, Reliance was the only bidder for basic services. The comparison of bids for both cellular and basic services also reflects the fact that some companies have indeed bid very conservatively.

The absence of any effort by the government to provide adequate information about the operating environment prior to bidding, seems to have resulted in overestimation of revenue to be generated. This is evident from the experience of cellular phone operators where they find that the subscriber base has not increased as much as projected and existing subscribers have a low airtime usage pattern, resulting in lower revenues per subscriber. This has led to losses incurred by cellular phone service companies (CMIE, March 1998). As a consequence, cellular phone companies have now appealed for moratorium in payment of fees in initial years of operation and extension of licence period from ten to fifteen years.

Due to absence of proper planning, almost all the policy announcements starting from access charges per unit of STD and ISD calls to interconnectivity have been followed by revisions and retractions. As a result of frequent changes, the entire process has been riddled with charges of corruption. This increased the political risk, making financial institutions even more reluctant to finance the investment. In some circles, companies even moved the Supreme Court alleging irregularities in the tendering process in the award of licences for basic services. All these have resulted in substantial delay in operation of private firms.[10]

In this context, we could have potentially learnt from the practical experiences of the Federal Communications Commission (FCC) of the USA in 1994 in designing auction procedures for the simultaneous award of multiple spectrum licences. The FCC has been successful in avoiding many of the above mentioned problems apart from tackling new complications brought about by the complementarities. The next section provides a glimpse.

LESSONS TO LEARN: THE US SPECTRUM AUCTIONS

The US Congress (acting upon the original suggestion made by Evan Kwerel of the FCC) empowered the FCC to auction thousands of Personal Communication Services (PCS) licences, each giving rights to a piece of the radio spectrum over a geographic area during 1994 and 1995. The FCC in turn sought proposals for the auction form from prospective bidders. After much public debate, the FCC adopted the simultaneous, ascending bid, multiple round auction form[11] proposed by leading economic theorists Paul Milgrom and Robert Wilson (of Stanford University) and Preston McAfee (of University of Texas) who were then consultants to Pacific Bell and AirTouch Communications respectively.[12] (see Box 2)

Box 2

Theory Pays!

The Economist called it 'When governments . . . need worldly advice, where can they turn? To mathematical economists, of course. . . . As for the firms that want to get their hands on a sliver of the airwaves, their best bet is to go out first and hire themselves a good game theorist.' The economic theorists probably never had it so good. The major telephone companies and government relied on their advice. Pacific Bell, Bell Atlantic, MCI as well as FCC hired game theorists as consultants. For once, it really paid to do theory!

According to this auction format, a group of licences with strong complementarities are open for bidding simultaneously. The bidding on these licences remains open till bidding ceases in every one of them. At the end of each round, all bidders are informed about the highest bid for each licence. While a bidder is allowed to enter bidding for any licence at any time, he is not allowed to withdraw a bid without a penalty. The auction in all licences simultaneously ends whenever there is a round with no new bids. Each round requires all bidders to submit sealed bids.

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[10] Till the end of 1997, only one private firm, Bharati Telnet had announced plans to commence basic telecommunications services in the Madhya Pradesh circle.

[11] We want to alert readers that the theoretical properties of these multi-unit auctions with complementarities are still not well understood and they remain a major focus of current research.

[12] This section relies heavily on the detailed analyses of Cramton (1997), McAfee and McMillan (1996), and McMillan (1994).

A cap on the total number of licences to be allotted to an individual bidder is imposed to promote competition. Designated firms (say those owned by minorities, women, and small-scale firms) are given bidding credits (from 10 per cent to 40 per cent) to offset inherent systemic disadvantages which they might face.

Each bidder is supposed to make an upfront payment before actual bidding begins, in order to ensure serious participation. If a bidder wins, she makes a down payment of 20 per cent within five business days after auction closes. The remaining 80 per cent is to be paid within five business days after the actual award of the licence (which happens one to three months after the conclusion of the auction).

Each bidder is informed about the identities of other bidders, designated firms, and their respective upfront payments. High bids and respective bidder identities are announced after each round. After each round, the high bidders are allowed to withdraw albeit with a penalty (which is the larger of 0 and the difference between the withdrawn bid and final sale price); if the high bid is withdrawn, the FCC becomes nominal winner and might consider reducing the reservation bid. The pace of the auction is controlled by restricting the number of rounds per day. In order to force the auction to conclude within a reasonable time frame, the FCC specifies minimum bid increments between rounds. There are certain other activity rules which are used to force each bidder to maintain a minimum level of bidding activity; we will not go into those details.

In order to impress upon the reader the sheer size of the auctions and care taken by the FCC, we now briefly provide some basic data. The FCC chose to test its auction form first in a small auction of ten narrow band PCS licences which did not involve any geographic aggregation issues. But each bidder was allowed to acquire three licences in any area. This auction lasted forty-seven rounds over five days and yielded US $ 617 million in revenue. It was followed by an auction of 30 regional narrowband licences (6 licences each in 5 regions); here, geographical aggregation was an issue albeit less complicated (as it was not nationwide). This auction lasted 105 rounds over a period of fourteen days and generated US $ 395 million. The third was 'the largest public auction so far', viz. the Major Trade Area (MTA) broadband PCS auction where ninety-nine licences were sold for US $ 7.7 billion. The bidding in the MTA auction lasted 112 rounds over three months. This was followed by an auction of 493 Basic Trade Area (BTA) licences for small bidders raising US $ 10.2 billion in 184 rounds of bidding over nearly five months.

On the whole, the FCC's auction form resulted in more information revelation. Licences which were similar to each other sold for similar prices. The bidding companies were able to form efficient aggregations. Implicit collusion was limited and the auctions ended within a reasonable time frame. It also turned out that minimum bid increments and activity rules were needed to efficiently pace the auction. The American experience makes one wonder what a well-thought-out and carefully laid and experimented plan cannot do!

CONCLUDING REMARKS

From the above arguments, it is evident that the auction mechanism plays an impotant role in successful privatization of any industry. Hence it is necessary to properly design the auction mechanism taking into consideration the economic and technical characteristics of the industry concerned and the institutional environment in which it is operating. It is also necessary to ensure transparency in the excecution of the auction mechanism in order to make any liberalization process a success. At micro level, it turns out that an ascending bid auction form or a more complex variant of it with reservation prices would perform well in real world auctions of enterprises or licences. Also, as a corollary, we hope to have convinced readers of the usefulness of academic research in general and economic theory in particular in solving 'real' problems. More importantly, the Indian experience in the allotment of licences to private firms for basic telecommunication services calls for careful scrutiny of the procedures used, at least for future exercises of private entry. While one can always learn from past mistakes, it is important to try not to commit them again.

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Appendix Tables

TABLE 1
Output Savings and Investment

(in Rs crore)

Year	GDP at market prices (1980–1 prices)	GDP at market prices (current prices)	GDP at factor cost (1980–1 prices)	GDP at factor cost (current prices)	PC GNPat factor cost (1980–1 prices)	GDS at at current prices	NDS at current prices	GDCF^c at 1980–1 prices	NDCF^c at 1980–1 prices
1970–1	101,362	43,163	90,246	39,708	1654	6783	3862	18,298	11,674
1971–2	103,203	46,257	91,339	42,248	1630	7508	4268	19,899	12,293
1972–3	102,566	51,005	91,048	46,473	1587	7833	4172	18,623	10,617
1973–4	105,596	62,007	95,192	56,954	1628	11,432	7165	23,664	15,279
1974–5	106,855	73,235	96,297	67,039	1617	12,726	7268	21,333	12,564
1975–6	116,675	78,761	104,968	71,201	1724	14,928	8605	22,014	12,787
1976–7	118,748	84,894	106,280	76,536	1710	18,030	11,250	24,175	14,432
1977–8	127,293	96,067	114,219	87,351	1797	20,230	12,861	26,311	16,078
1978–9	134,638	104,190	120,504	93,880	1857	24,138	15,712	31,768	20,932
1979–80	127,572	114,356	114,236	102,442	1723	24,698	14,427	28,401	16,959
1980–1	136,013	136,013	122,427	122,427	1808	28,786	16,699	30,880	18,793
1981–2	144,900	159,760	129,889	143,216	1878	31,597	17,138	30,767	17,979
1982–3	150,379	178,132	133,915	159,395	1883	33,774	16,888	30,103	16,508
1983–4	161,547	207,589	144,865	186,723	1990	39,294	20,065	31,378	16,909
1984–5	167,489	231,343	150,433	208,533	2020	42,178	20,087	31,018	15,570
1985–6	176,648	262,243	156,566	233,799	2058	51,933	25,696	36,641	20,301
1986–7	185,250	292,949	163,271	260,030	2095	54,801	24,978	36,259	18,966
1987–8	194,085	333,201	170,322	294,851	2134	69,631	36,290	42,657	24,323
1988–9	213,345	395,782	188,461	352,706	2301	84,668	45,747	49,857	30,381
1989–90	227,367	456,821	201,453	408,662	2410	102,370	56,724	52,698	31,931
1990–1	240,238	535,534	212,253	477,814	2485	129,999	77,804	62,257	40,222
1991–2	241,255	616,799	213,983	552,768	2449	140,736	78,172	52,271	28,841
1992–3	254,360	705,918	225,268	630,772	2528	155,733	82,279	56,691	31,832
1993–4	266,653	809,766	238,864	732,874	2636	186,707	102,158	59,412	32,871
1994–5	286,830	953,680	256,095	868,019	2791	237,840	151,748	77,636	48,900
1995–6	307,854	1,098,576	274,209	1,006,286	2945	281,014	171,417	84,584	53,556
1996–7^a	332,721	1,276,974	296,845	1,149,215	3118	333,816	206,634	91,325	57,907
1997–8^b	—	—	311,828	—	—	—	—	—	—

Notes: [a] Quick estimates.
[b] Advance estimates.
[c] Adjusted for error omissions

GDP: gross domestic product, GNP: gross national product, PC: per capita, GDS: gross domestic savings, NDS: net domestic savings, GDCF: gross domestic capital formation, NDCF: net domestic capital formation

Source: Handbook of Statistics on Indian Economy, RBI (1998).

TABLE 2
Sectoral GDP
(in percentages)

(at 1980–1 prices)

Year	Agriculture & allied activities	Mining & quarrying	Manufacturing	Electricity, gas, & water supply	Construction	Trade, hotels, transport, & communication	Financing insurance, real estate, & business services	Community social & personal services
1970–1	44.5	1.3	16.1	1.2	5.0	14.2	8.0	9.6
1971–2	43.2	1.3	16.5	1.3	5.0	14.4	8.4	9.9
1972–3	41.2	1.4	17.2	1.3	5.1	14.8	8.7	10.3
1973–4	42.2	1.4	17.2	1.3	4.6	14.7	8.5	10.1
1974–5	41.1	1.4	17.5	1.3	4.4	15.4	8.4	10.5
1975–6	42.6	1.4	16.4	1.4	4.6	15.4	8.2	9.9
1976–7	39.6	1.5	17.6	1.6	5.0	15.9	8.8	10.1
1977–8	40.5	1.4	17.4	1.5	5.1	15.8	8.6	9.6
1978–9	39.3	1.4	18.5	1.6	4.7	16.2	8.7	9.5
1979–80	36.2	1.5	18.9	1.7	4.7	16.9	9.3	10.8
1980–1	38.1	1.5	17.7	1.7	5.0	16.7	8.8	10.5
1981–2	38.0	1.6	18.0	1.7	5.0	16.7	8.7	10.2
1982–3	36.4	1.8	18.6	1.8	4.6	17.0	9.0	10.7
1983–4	37.3	1.7	18.9	1.8	4.5	16.6	8.9	10.2
1984–5	35.9	1.7	19.4	1.9	4.5	16.9	9.1	10.5
1985–6	34.6	1.7	19.4	2.0	4.6	17.6	9.4	10.7
1986–7	32.6	1.8	19.9	2.1	4.6	18.0	9.7	11.2
1987–8	31.4	1.8	20.4	2.2	4.6	18.12	9.9	11.5
1988–9	33.0	1.9	20.1	2.2	4.4	17.6	9.8	11.0
1989–90	31.4	1.9	21.0	2.2	4.4	17.8	10.1	11.2
1990–1	30.9	2.0	21.1	2.3	4.6	17.8	10.2	11.1
1991–2	30.0	2.0	20.2	2.5	4.7	18.0	11.2	11.4
1992–3	30.2	2.0	20.0	2.5	4.6	18.2	11.1	11.4
1993–4	29.5	1.9	20.4	2.5	4.4	18.4	11.8	11.1
1994–5	28.8	1.8	21.2	2.6	4.3	18.9	11.7	10.7
1995–6	26.0	1.9	22.5	2.6	4.4	20.0	12.0	10.6
1996–7[a]	26.1	1.7	22.5	2.5	4.3	20.2	12.1	10.4
1997–8[b]	24.4	1.8	22.7	2.5	4.3	20.4	12.7	11.3

Notes: [a] Quick estimates
[b] Advance estimates

Source: Handbook of Statistics on Indian Economy, RBI (1998).

TABLE 3a
Exports of Principal Commodities

(Rs crore)

Commodities	1987–8	1988–9	1989–90	1990–1	1991–2	1992–3	1993–4	1994–5	1995–6	1996–7	1997–8P
Animal & vegetable products, prepared foodstuffs, beverages, & tobbaco	3379	3674	4883	5455	7906	9256	12,360	13,543	20,917	23,413	—
Mineral products	1423	1521	2106	2445	3071	3343	3925	4148	4822	5018	—
Products of chemical or allied industries	735	1372	2318	2549	3786	3669	4940	6479	8225	10,154	—
Plastics & articles thereof, rubber & articles thereof	122	168	311	391	500	968	1614	2144	2630	2625	—
Hides and skins, leather products, footwear	1321	1608	2077	2676	3249	3878	4382	5341	6109	5959	—
Textiles & textile articles	4135	4592	6622	8891	12,014	14,795	17,963	22,571	27,199	32,518	—
Jewellery	2617	4396	5296	5253	6759	8921	12,581	14,177	17,695	16,950	—
Base metals & articles of base metals	377	716	1101	1324	2007	3201	4420	4559	5928	6922	—
Machinery & its parts	755	1072	1468	1705	2134	2276	3083	3849	5332	6766	—
Transport equipment	259	365	551	723	1224	1546	1857	2422	3039	3439	3117
Project goods	14	63	37	161	46	67	45	67	109	187	161
Others	537	685	888	985	1346	1777	2528	3382	4295	4877	—

Note: P—Provisional
Sources: Report on Currency and Finance, RBI, various issues (1990–1 to 1997–8).

TABLE 3b
Imports of Principal Commodities

(Rs crore)

Commodities	1987–8	1988–9	1989–90	1990–1	1991–2	1992–3	1993–4	1994–5	1995–6	1996–7	1997–8
Animal & vegetable products, prepared foodstuffs, beverages, & tobbaco	907	1544	1046	1112	1032	2187	2043	4651	2838	3313	—
Animal & vegetable fats & oil & their cleavage products, prepared edible fats, animal or vegetable waxes	1016	782	251	364	342	287	346	877	2550	3069	—
Mineral products	4750	5476	7792	12,807	15,444	20,036	20,954	23,204	31,125	42,515	15,674
Products of chemical or allied industries	1848	3099	4233	4696	6417	8104	8411	11,783	16,754	15,675	—
Plastics & articles thereof, rubber & articles thereof	753	1068	1312	1478	1755	1684	1971	2696	4249	3931	—
Paper & paper board, & articles thereof	593	695	761	1043	886	1134	1699	1621	2808	2895	—
Textiles & textile articles	452	690	773	896	826	1398	1699	2963	3260	2780	—
Jewellery	2038	3205	4283	3759	4865	7756	9110	7436	10,104	14,090	—
Base metals & articles of base metals	2571	3620	4731	4841	4149	5452	5668	8352	10,881	12,215	—
Machinery & its parts	3891	4334	5203	5823	5497	7473	9498	13,427	21,120	20,790	—
Transport equipment	760	753	1489	1670	915	1338	3986	3499	3705	5275	—
Instruments & apparatus	504	695	905	1084	972	1452	1442	1695	2526	2143	—
Project goods	1726	1574	1738	2556	3626	3703	5091	5820	7998	7520	5879
Others	435	700	811	1064	1125	1371	1480	1946	2762	2709	—

Note: P—Provisional
Sources: Report on Currency and Finance, RBI, various issues (1990–1 to 1997–8).

TABLE 4a
Balance of Payments

(US dollars million)

Items	1990–1	1991–2	1992–3	1993–4	1994–5	1995–6	1996–7	1997–8
Current Account								
Exports (f.o.b.)	18,477	18,266	18,869	22,683	26,855	32,311	34,133	34,849
Imports (c.i.f.)	27,914	21,064	23,237	25,069	35,904	43,670	48,948	51,126
Trade balance	-9437	-2798	-4368	-1285	9049	-11,359	-14,818	-16,277
Invisibles (net)	-243	1620	842	1228	5680	5460	10,321	9804
Current account balance	-9680	-1178	-3526	-1158	-3369	-5899	-4494	-6473
Capital Account								
Total capital account	7188	3968	2966	9835	9156	4678	11,287	10,984
External assistance, net	2210	3037	1859	1901	1526	883	1109	899
Net foreign investment	102	139	555	4235	4807	4604	5838	4993
Private transfers, net	2069	3783	3852	5265	8093	8506	12,367	11,830
NRI deposits, net	1536	290	2001	1205	172	1103	3350	1125
Overall balance	-2492	-2790	-560	8677	5787	-1221	6793	4511

Source: RBI *Annual Report*, various issues.

TABLE 4b
Selected Indicators of External Sector
(as a percentage of GDP)

Items	1990–1	1991–2	1992–3	1993–4	1994–5	1995–6	1996–7	1997–8
Exports	6.2	7.3	7.8	8.8	8.8	9.7	9.4	—
Imports	9.4	8.3	10.2	10.3	11.7	13.1	13.8	—
Trade balance	-3.2	-1.1	-2.4	-1.6	-2.9	-3.4	-4.0	—
Current account balance	-3.2	-0.4	-1.8	-0.4	-1.1	-1.8	-1.0	-1.5
External debt	30.4	41.0	39.8	35.8	32.3	28.2	25.9	23.8

Source: Economic Survey, 1997–8.

TABLE 4c
Exchange Rate of the Rupee *vis-à-vis* the US Dollar, Pound Sterling, Deutsche Mark, and Yen

(Rupee per unit of foreign currency) (Financial year average)

Year	US dollar	Pound sterling	DM	Japanese yen[a]
1970–1	7.5578	18	2.049	2.08
1971–2	7.4731	18.4	2.1974	2.04
1972–3	7.675	18.8425	2.4392	3
1973–4	7.7925	18.8	3.0075	3
1974–5	7.9408	18.8	3.1917	3
1975–6	8.6825	18.3933	3.4458	3
1976–7	8.9775	15.5733	3.6308	3
1977–8	8.5858	15.4292	3.8358	3.33
1978–9	8.2267	15.9658	4.22	4
1979–80	8.0975	17.655	4.4717	3.58
1980–1	7.9092	18.5042	4.1875	3.75
1981–2	8.9683	17.1096	3.8607	3.94
1982–3	9.666	16.1356	3.96	3.89
1983–4	10.34	15.4174	3.9402	4.38
1984–5	11.8886	14.8668	3.9877	4.87
1985–6	12.2349	16.8467	4.5553	5.62
1986–7	12.7782	19.0722	6.297	8.02
1987–8	12.9658	22.0872	7.4004	9.41
1988–9	14.4817	25.5959	8.0494	11.3
1989–90	16.6492	26.9179	9.0922	11.66
1990–1	17.9428	33.193	11.4351	12.79
1991–2	24.4737	42.5151	14.6148	18.44
1992–3	30.6488	51.6858	19.5877	24.59
1993–4	31.3655	47.2064	18.7043	29.11
1994–5	31.3986	48.8211	20.2017	31.6341
1995–6	33.4498	52.3526	23.3993	34.8425
1996–7	35.4999	56.3646	22.9244	31.5879
1997–8	37.1648	61.024	20.9613	30.299

Note: [a] Rupees per 100 yen.

Source: Handbook of Statistics on Indian Economy, RBI (1998).

TABLE 5
Price Indices

Year	WPI (all commodities)	Index of manufactured product (1970–1=100)	Index of agricultural products	CPI (all India average)	
				Industrial workers (1982=100)	Agricultural labourers (1960–1=100)
1971–2	105.6	109.5	100.4	39	196
1972–3	116.2	121.9	110.3	42	217
1973–4	139.7	139.5	139.2	51	263
1974–5	174.9	168.8	169.9	64	354
1975–6	173.0	171.2	157.3	63	340
1976–7	176.6	175.2	158.3	61	340
1977–8	185.8	179.5	171.9	66	324
1978–9	185.8	215.8	174.8	67	317
1979–80	217.6	257.3	188.7	73	346
1980–1	256.2	270.6	210.5	81	395
1981–2		(1981–2=100 (base) (for WPI)		91	444
1982–3	104.9	103.5	107.3	99	467
1983–4	112.8	109.8	121.4	111	520
1984–5	120.1	117.5	129.2	118	521
1985–6	125.4	124.4	129.1	126	546
1986–7	132.7	129.2	142.8	137	572
1987–8	143.6	138.5	161.8	149	629
1988–9	154.3	151.6	170.9	166	708
1989–90	165.7	168.6	174.4	173	746
1990–1	182.7	182.8	198.3	193	803
1991–2	207.8	203.4	236.7	219	958
1992–3	228.7	225.6	255.6	240	1076
1993–4	247.8	243.2	271.2	258	1114
1994–5	274.7	268.8	307.7	284	1247
1995–6	295.8	293.1	330.5	313	1381
1996–7	314.6	305.0	358.4	342	256
1997–8	329.8	317.5	370.0	366	264
1998–9[a]	350.5	330.1	413.7	—	—

Note: [a] Provisional average April to December 1998.
WPI: Wholesale Price Indices.
CPI: Consumer Price Indices.

Source: *Economic Survey*, various issues.

TABLE 6
Foreign Investment Inflows

Year	Direct investment		Portfolio investment		Total	
	2	3	4	5	2+4	3+5
	Rs crore	$ million	Rs crore	$ million	Rs crore	$ million
1990–1	174	97	11	6	185	103
1991–2	316	129	10	4	326	133
1992–3	965	315	748	244	1713	559
1993–4	1838	586	11,188	3567	13,026	4153
1994–5	4126	1314	12,007	3824	16,133	5138
1995–6	7135	2133	9192	2748	16,327	4881
1996–7	9571	2696	11,758	3312	21,328	6008
1997–8	11,824	3197	6696	1828	18,520	5025

Source: Handbook of Statistics on Indian Economy, RBI (1998).

TABLE 7
Poverty Estimates for Rural and Urban India

Period	Rural			Urban			Gini coefficients		
	H	PG	SPG	H	PG	SPG	Rural	Urban	All India
1956–7	58.86	19.45	8.5	51.45	18.16	8.51	0.319	0.402	0.3417
1957–8	55.16	19.01	8.78	47.75	15.95	7.00	0.334	0.359	0.3536
1958–9	53.26	17.74	7.88	44.76	13.75	5.87	0.34	0.348	0.3446
1959–60	50.89	15.29	6.13	49.17	15.83	6.75	0.314	0.357	0.3664
1960–1	45.4	13.6	5.53	44.65	13.84	5.83	0.321	0.35	0.3259
1961–2	47.2	13.6	5.31	43.55	13.79	6.05	0.312	0.357	0.3308
1963–4	48.53	13.88	5.49	44.83	13.29	5.17	0.297	0.36	0.3073
1964–5	53.66	16.08	6.6	48.78	15.24	6.38	0.294	0.349	0.3105
1965–6	57.6	17.97	7.6	52.9	16.82	6.98	0.297	0.339	0.3114
1966–7	64.3	22.01	10.01	52.24	16.81	7.19	0.293	0.337	0.3106
1967–8	63.67	21.8	9.85	52.91	16.93	7.22	0.291	0.332	0.3055
1968–9	59.00	18.96	8.17	49.29	15.54	6.54	0.305	0.329	0.3166
1970–1	54.84	16.55	6.8	44.98	13.35	5.35	0.288	0.346	0.3038
1972–3	55.36	17.35	7.33	45.67	13.46	5.26	0.305	0.345	0.3185
1973–4	55.72	17.18	7.13	47.96	13.6	5.22	0.282	0.317	0.2917
1977–8	50.6	15.03	6.06	40.5	11.69	4.53	0.312	0.337	0.3214
1983	45.31	12.65	4.84	35.65	9.52	3.56	0.301	0.334	0.3149
1986–7	38.81	10.01	3.7	34.29	9.1	3.4	0.302	0.356	0.3222
1987–8	39.6	9.7	3.4	35.65	9.31	3.25	0.302	0.356	0.3182
1988–9	39.06	9.5	3.29	36.6	9.54	3.29	0.295	0.356	0.3115
1989–90	34.3	7.8	2.58	33.4	8.51	3.04	0.282	0.356	0.3046
1990–1	36.43	8.64	2.93	32.76	8.51	3.12	0.277	0.34	0.2969
1991	37.42	8.29	2.68	33.23	8.24	2.9	0.311	0.351	0.3253
1992	43.47	10.88	3.81	33.73	8.82	3.19	0.298	0.356	0.3202
1993–4	38.74	9.41	3.27	30.03	7.62	2.76	0.285	0.345	—

Notes: H = head count ratio; PG = poverty gap; SPG = square poverty gap.

Source: For estimates up to 1992, B. Ozler, G. Dutt, and M. Ravallion (1996); for 1993–4 A. Sen (1996); (Gini Coefficients): Government of India (1981), *A Technical Note on the Sixth Plan of India.* New Delhi: Planning Commission and Tendulkar (1998) for rural and urban sectors; World Bank for all India figures: http://www.worldbank.org/html/prdmg/grwthweb/growth t.htm.

TABLE 8a
Literacy across States of India

(1991)

States	Literacy rates(%)			Literacy rates(%)	
	Persons	Males	Females	Scheduled castes	Scheduled tribes
Andhra Pradesh	44.4	55.1	32.7	32	17
Arunachal Pradesh	41.6	51.5	29.7	57	34
Assam	52.9	61.9	43.0	54	49
Bihar	38.5	52.5	22.9	20	27
Goa	75.5	83.6	67.1	59	43
Gujarat	61.3	73.1	48.6	61	36
Haryana	55.8	69.1	40.5	39	0
Himachal Pradesh	63.9	75.4	52.1	53	47
Jammu & Kashmir	—	—	—	—	—
Karnataka	56.0	67.3	44.3	38	36
Kerala	89.8	93.6	86.2	80	57
Madhya Pradesh	44.2	58.4	28.8	35	22
Maharashtra	64.9	76.6	52.3	56	37
Manipur	59.9	71.6	47.6	56	54
Meghalaya	49.1	53.1	44.9	44	47
Mizoram	82.3	85.6	78.6	78	83
Nagaland	61.6	67.6	54.7	0	61
Orissa	49.1	63.1	34.7	37	22
Punjab	58.5	65.7	50.4	41	0
Rajasthan	38.6	55.0	20.4	26	19
Sikkim	56.9	65.7	46.7	51	59
Tamil Nadu	62.7	73.7	51.3	47	28
Tripura	60.4	70.6	49.6	57	40
Uttar Pradesh	41.6	55.7	25.3	27	36
West Bengal	57.7	67.8	46.6	42	28

Source: Census of India, 1991.

TABLE 8b
Life Expectancy at Birth and Mortality

State	LEB (years)		Infant mortality rates (1995)	Under-5 mortality rates (1992–3)	Underweight children moderate & severe (%) (1992–3)	
	Males 1989–93	Females 1989–93			Rural	Urban
Andhra Pradesh	59.5	61.5	66	91.2	52.1	40.2
Arunachal Pradesh	—	—	—	72	40.3	36.2
Assam	54.6	55.3	77	142.2	51.8	37.3
Bihar	59.7	57.2	73	127.5	64.1	53.8
Goa	—	—	—	38.9	36.2	33.2
Gujarat	59	61.1	62	104	45.8	40.5
Haryana	62.5	63.7	68	98.7	39.4	33
Himachal pradesh	63.6	63.6	—	69.1	48.3	30.2
Jammu& Kashmir	—	—	—	59.1	46.8	31
Karnataka	60.2	63.5	62	87.3	57.3	47
Kerala	68.8	74.7	16	32	30.6	22.9
Madhya Pradesh	54.1	53.8	99	130.3	59.4	50.1
Maharashtra	63	65.4	55	70.3	57.5	45.5
Manipur	—	—	—	61.7	31.6	25.9
Meghalaya	—	—	—	86.9	47.2	37.5
Mizoram	—	—	—	29.3	34.5	22
Nagaland	—	—	—	20.7	30.5	19.7
Orissa	55.7	55.3	103	131	54.9	44.3
Punjab	65.2	67.3	54	68	47.4	40
Rajasthan	57.4	58.5	85	102.6	41.1	43.9
Sikkim				NA		
Tamil Nadu	61.4	63.4	56	86.5	52.1	37.3
Tripura				104.6	53	31.6
Uttar Pradesh	56.5	55.1	86	141.3	50.5	46.9
West Bengal	60.8	62.3	59	99.3	60.4	44.8

Note: LEB: life expectancy at birth.
Infant mortality rates & under-5 mortality rates (per thousand).

Source: India: The Road to Human Development, India Development Forum, Paris, 23–5 June,1997. UNDP Documents of the United Nations Development Programme, New Delhi.

TABLE 9a
Risk and Return on Indian Financial Markets
(daily frequency)

	Equity index returns		Dollar rupee returns		Change in overnight rate	
	Mean	Std Dev.	Mean	Std Dev	Mean	Std Dev
1979	–0.08692	0.87	—	—	—	—
1980	0.15252	1.00	—	—	—	—
1981	0.28872	1.42	—	—	—	—
1982	0.01845	1.47	—	—	—	—
1983	0.03909	0.91	—	—	—	—
1984	0.03860	0.78	—	—	—	—
1985	0.33403	1.74	—	—	—	—
1986	0.04929	1.93	—	—	—	—
1987	–0.04564	1.52	—	—	—	—
1988	0.21259	1.70	—	—	—	—
1989	0.07712	1.52	—	—	—	—
1990	0.16187	2.28	0.05934	0.56	—	—
1991	0.26911	1.72	0.15604	1.09	—	—
1992	0.21770	3.32	0.08137	0.87	—	—
1993	0.16290	1.74	0.00807	0.36	—	—
1994	0.06448	1.41	0.00019	0.10	—	—
1995	–0.10387	1.24	0.04825	0.57	—	—
1996	0.00739	1.53	0.00984	0.53	–0.02473	2.32
1997	0.09199	1.87	0.04064	0.31	–0.00815	2.28
1998	–0.06403	1.77	0.03608	0.41	0.00176	5.94

Note: Std. Dev—standard deviation.

Source: Report on Currency and Finance, RBI, various issues;
Unpublished data from NSE; also from Websites http://www.internetsecurities.com and http://www.nseindia.com

TABLE 9b
Measures of Liquidity

	On equity market			On debt market		
	Trading Volume (Rs billion)		Nifty Impact cost (at Rs 5 million) (per cent)		Trading Volume (Rs crore)	
	NSE	BSE			RBI's SGL	NSE's WDM
1990–1	—	360	—	1994	—	4090
1991–2	—	718	—	1995	39,379	12,264
1992–3	—	457	—	1996	113,583	27,750
1993–4	—	845	—	1997	181,663	104,903
1994–5	—	677	—	1998	188,926	96,310
1995–6	682	501	—			
1996–7	2945	1227	0.23			
1997–8	3702	2073	0.27			
1998–9	4200	3100	0.22			

Notes: NSE: national stock exchange; BSE: Bombay stock exchange;
SGL: securities general ledger; WDM: wholesale debt market.

Source: Report on Currency and Finance, RBI, various issues; unpublished data from NSE; also from Websites http://www.internetsecurities.com and http://www.nseindia.com

TABLE 10
Employment by Sectors
(all India)

Sector/Sex/Industry	1972–3	1977–8	1983	1987–8	1993–4
Persons					
1. Agriculture	73.9	71	68.6	65	64.7
2. Mining & quarrying	0.4	0.4	0.6	0.7	0.7
3. Manufacturing	8.8	10.2	10.7	11.1	10.5
4. Electricity, gas, & water	0.2	0.3	0.3	0.3	0.4
5. Construction	1.9	1.7	2.2	3.8	3.2
6. Trade	5.1	6.1	6.2	7.2	7.4
7. Transport & storage	1.8	2.1	2.5	2.6	2.8
8. Services	7.9	8.1	8.9	9.3	10.3
All	100	100	100	100	100
Males					
1. Agriculture	68.8	65.6	62.6	58.7	58.3
2. Mining & quarrying	0.5	0.6	0.7	0.8	0.9
3. Manufacturing	9.9	11	11.7	11.9	11
4. Electricity, gas, & water	0.3	0.4	0.4	0.5	0.5
5. Construction	2.1	2.2	2.9	4.2	4.1
6. Trade	6.5	7.8	8	9.2	9.5
7. Transport & storage	2.6	3.1	3.6	3.9	4.0
8. Services	9.3	9.4	10.6	10.8	11.7
All	100	100	100	100	100
Females					
1. Agriculture	84.3	81.8	81.2	77.7	78
2. Mining & quarrying	0.3	0.2	0.4	0.5	0.4
3. Manufacturing	6.6	8.5	8.9	9.5	9.3
4. Electricity, gas, & water	—	—	—	—	—
5. Construction	1.3	0.8	1	2.8	1.2
6. Trade	2.3	2.8	2.7	3.1	3.2
7. Transport & storage	0.1	0.2	0.3	0.2	0.3
8. Services	5.1	5.7	5.5	6.2	7.6
All	100	100	100	100	100

Source: T. S. Papola and Alakh N. Sharma (eds), *Gender and Employment in India*, 1998.

TABLE 11

Incidence of Unemployment according to Alternative Concepts by Sex and Rural-Urban Residence

(NSS data for 1972–3 to 1993–4)

Concept/Year	India			Rural India			Urban India		
	Females	Males	Persons	Females	Males	Persons	Females	Males	Persons
Usual status									
1972–3	1.0	1.9	1.6	0.5	1.2	0.9	6.0	4.8	5.1
1977–8	3.3	2.2	2.6	2.0	1.3	1.5	12.4	5.4	7.1
1983	1.2	2.3	1.9	0.7	1.4	1.1	4.9	5.1	5.0
1987–8	2.9	2.6	2.7	2.4	1.8	2.0	6.2	5.2	5.4
1993–4	1.4	2.2	1.9	0.8	1.4	1.1	6.2	4.0	4.4
Weekly status									
1972–3	5.9	3.7	4.3	5.5	3.0	3.9	9.2	6.0	6.6
1977–8	5.0	4.4	4.5	4.0	3.6	3.7	10.9	7.1	7.8
1983	4.8	4.4	4.5	4.3	3.7	3.9	7.5	6.7	6.8
1987–8	5.0	4.8	4.8	4.3	4.2	4.2	9.2	6.6	7.0
1993–4	3.8	3.5	3.6	3.0	3.0	3.0	8.4	5.2	5.8
Daily status									
1972–3	11.5	7.0	8.3	11.2	6.8	8.2	13.7	8.0	9.0
1977–8	10.0	7.6	8.2	9.2	7.1	7.7	14.5	9.4	10.3
1983	9.3	8.0	8.3	9.0	7.5	7.9	11.0	9.2	9.6
1987–8	7.5	5.6	6.1	6.7	4.6	5.2	12.0	8.8	9.4
1993–4	6.3	5.9	6.0	5.6	5.6	5.6	10.5	6.7	7.4

Note: unemployment rate = ratio of unemployment/labour force.

Source: T. S. Papola and Alakh N. Sharma (eds), *Gender and Employment in India*, 1998.

TABLE 12
Air Pollution in Different Cities

City	SO_2				NO_2				SPM			
	1995		1996		1995		1996		1995		1996	
	I	R	I	R	I	R	I	R	I	R	I	R
Ahmedabad	L	H	L	M	L	L	L	L	M	C	M	C
Baroda	M	H	M	H	L	L	L	L	M	C	M	C
Bhilai	L	L	L	L	L	M	L	M	H	C	M	C
Bhopal	L	L	L	L	L	L	L	M	M	C	M	C
Calcutta	M	M	L	L	L	M	L	M	H	C	H	
Cochin	L	L	L	L	L	L	L	L	L	M	L	
Dehra Dun	L	L			L	L	H	C				
Delhi	L	M	L	L	M	M	M	H	H	C	H	C
Dhanbad		M		M		M		M		C		C
Howrah	L	C		C	C	C		C	M	C	M	C
Hyderabad	L	L	L	L	M	M	M	L	M	H		
Indore	L	L	L	L	L	L	L	L	H	C	H	C
Jaipur	L	L	L	L	L	M	M	L	M	C		C
Jodhpur	M	M	L	M	L	M	L	M	H	C	H	C
Kanpur	L	L	L	L	L	L	L	L		C	H	C
Kozhikode		L	L	L		L	L	L		M	L	M
Lucknow	L	M		M	L	L		M	H	C		C
Madras	L	L	L	L	L	L	L	L	M		M	
Mumbai	M	L	L	L	L	M	L	M		C		
Nagpur	L	L	L	L	L	L	L	L	M	C	L	C
Patna		L		M		L		M		C		C
Raipur	L	L	L	L	L	L	L	L	M	C	M	C
Rajkot	L	L	L	L	L	L	L	L	C	C	C	C
Satna	L	L	L	L	L	L	L	L	M	C	M	H
Surat	H	C	M	H	L	M	L	L	M	C	M	C
Trivandrum		L	L	L		L	L	L		H	M	H
Udaipur		L	L	L		M	L	L		C	H	C
Vishakhapatnam	L	L	L	L			M	H			L	C

Notes: I = industrial; R = residential
L = low; M = medium; H = high; C = critical
SO_2: Sulphur di-oxide; NO_2: Nitrogen di-oxide; SPM: suspended particulated matters
CPCB range classification Annual mean concentration range.

Source: Central Pollution Control Board, http://www.nic.in/envfor/cpcb/aaq/aaq_mg.html.
(microgram per cubic meter of ambient air)

	Industrial		Residential	
	SO_2 & NO_2	SPM	SO_2 & NO_2	SPM
Low	0–40	0–180	0–30	0–70
Moderate	40–80	180–360	30–60	70–140
High	80–120	360–540	60–90	140–210
Critical	>120	>540	>90	>210

TABLE 13

Water Pollution: State of Major Rivers

River	Number of stations	Observed water quality (1994) No. of sample stations					Critical parameters
		A	B	C	D	E	
Baitarani	4				4		BOD
Brahmani	11				11		BOD
Brahmaputra	9			1	7	1 NA	T. Coliforms, BOD
Cauvery	18			6	12		pH, T. Coliforms, DO, BOD
Ganga	27		1	4	11	11 NA	T. Coliforms, BOD
Godavari	10				6	4 NA	BOD
Krishna	13			4	5	4 NA	BOD
Mahi	7		1	5		1 NA	BOD, T. Coliforms
Mahanadi	16		2		14		BOD
Narmada	14		4	4	3	2 E + 1 NA	BOD, T. Coliforms
Sabarmati	7				1	6 E	BOD, T. Coliforms
Tapi	8		3		4	1 NA	BOD, T. Coliforms

Notes: NA = Data not available

A = Drinking water source without conventional treatment but after disinfection;

B = Outdoor bathing;

C = Drinking water source with conventional treatment followed by disinfection;

D = Propagation of wildlife, fisheries;

E = Irrigation, industrial cooling, controlled waste disposal

BOD: Biological Oxygen demand

DO: Dissolved Oxygen

Source: CPCB, 1996, Water Quality—Status and Statistics (1993 and 1994), Monitoring of Indian National Aquatic Resources MINARS/10/1995–6.

TABLE 14
Key Deficit Indicators of the Central Government

(Rs crore)

Year	Gross fiscal deficit (GFD)	Primary deficit (net)(PD)	Revenue deficit (RD)	Monetized deficit[a] (MD)	As percentage of GDP at current market prices			
					GFD	PD	RD	MD
1970–1	1409	748	–163	223	3.26	1.73	–0.38	0.52
1971–2	1727	1146	100	583	3.73	2.48	0.22	1.26
1972–3	2530	857	14	1211	4.96	1.68	0.03	2.37
1973–4	1733	627	–237	630	2.79	1.01	–0.38	1.02
1974–5	2303	640	–764	528	3.14	0.87	–1.04	0.72
1975–6	3029	1070	–887	–288	3.85	1.36	–1.13	–0.37
1976–7	3801	1302	–312	816	4.48	1.53	–0.37	0.96
1977–8	3681	1733	–430	–260	3.83	1.8	–0.45	–0.27
1978–9	5708	1723	–292	2191	5.48	1.65	–0.28	2.1
1979–80	7338	1342	694	2650	6.42	1.17	0.61	2.32
1980–1	8299	4301	2037	3551	6.1	3.16	1.5	2.61
1981–2	8666	3611	392	–3207	5.42	2.26	0.25	–2.01
1982–3	10,627	4887	1308	3368	6.97	2.74	0.73	1.89
1983–4	13,030	6044	2540	3949	6.28	2.91	1.22	1.9
1984–5	17,416	8961	4225	6055	7.53	3.87	1.83	2.62
1985–6	21,857	10,626	5889	6190	8.33	4.05	2.25	2.36
1986–7	26,342	13,143	7777	7091	8.99	4.49	2.65	2.42
1987–8	27,044	12,935	9137	6559	8.12	3.88	2.74	1.97
1988–9	30,923	13.473	10,515	6503	7.81	3.4	2.66	1.64
1989–90	35,632	14,439	11,914	13,813	7.8	3.16	2.61	3.02
1990–1	44,632	17,942	18,562	14,745	8.33	3.35	3.47	2.75
1991–2	36,325	8961	16,261	5508	5.89	1.45	2.64	0.89
1992–3	40,173	11,644	18,574	4257	5.69	1.65	2.63	0.6
1993–4	60,257	24,331	32,716	260	7.43	3.00	4.04	0.03
1994–5	57,704	12,050	31,029	2130	5.99	1.25	3.22	0.22
1995–6	60,243	10,806	29,730	19,855	5.38	0.97	2.66	1.77
1996–7	66,733	9022	32,654	1934	5.23	0.71	2.56	0.15
1997–8 RE	86,345	21,086	43,686	12,914	6.1	1.49	3.09	0.91
1998–9 BE	91,025	19,298	48,068	(–)	5.6	1.19	2.96	(–)

Notes: RE: revised estimates, BE: budget estimates

[a] As per RBI Records

(–) Indicates Surplus

Source: Budget Documents of Government of India.

TABLE 15
Receipts and Expenditures of Central Government

(Rs crore)

Year	Direct tax (gorss)[c]	Indirect tax (gross)[c]	Corporation tax	Revenue receipts	Capital receipts	Total receipts	Govt final consumption expenditure	Defence expenditure (net)[d]	Interest payments	Subsidies[b]
1970–1	876	2330	371	3342	2046	5388	3838	1199	606	94
1971–2	1056	2817	472	4028	2504	6532	4458	1526	670	104
1972–3	1252	3258	558	4578	2395	6973	4728	1652	776	205
1973–4	1391	3678	583	5073	2976	8049	5156	1681	882	361
1974–5	1664	5598	709	6558	2774	9332	6241	2112	1001	419
1975–6	2221	5387	862	8075	4149	12,224	7381	2472	1228	470
1976–7	2348	5923	984	8739	4958	8846	8229	2562	1374	947
1977–8	2427	6432	1221	9791	5035	14,826	8759	2634	1521	1287
1978–9	2560	7966	1256	11,240	6285	17,525	9722	2868	1829	1475
1979–80	2826	9148	1392	11,340	5420	16,760	11,165	3356	2210	1821
1980–1	2907	10,242	1311	11,937	7642	19,579	13,084	3604	2604	2028
1981–2	3552	12,264	1970	14,631	8360	22,991	15,335	4329	3195	1941
1982–3	3873	13,784	2185	17,036	10,995	28,031	18,272	5021	3938	2262
1983–4	4320	16,367	2493	19,366	13,273	32,639	21,141	5831	4795	2749
1984–5	4626	18,802	2556	23,466	16,421	39,887	24,352	7061	5974	4038
1985–6	5564	23,067	2865	28,035	19,315	47,350	29,174	7988	7512	4796
1986–7	6236	26,602	3160	33,083	21,572	54,655	34,625	10,477	9246	5451
1987–8	6748	30,918	3433	37,037	25,408	62,445	40,843	11,968	11,251	5980
1988–9	8825	35,649	4407	43,591	29,878	73,469	47,331	13,341	14,278	7732
1989–90	10,005	41,631	4729	52,296	30,020	82,316	54,203	14,416	17,757	10,474
1990–1	11,024	46,489	5335	54,954	38,997	93,951	61,779	15,426	21,498	12,158
1991–2	15,200	52,059	7853	66,031	38,528	104,559	69,459	16,347	26,596	12,253
1992–3	18,132	56,434	8899	74,128	36,178	110,306	78,596	17,582	31,075	11,995
1993–4	20,298	55,392	10,060	75,453	55,440	130,893	89,926	21,845	36,741	12,682
1994–5	26,966	65,328	13,822	91,083	68,695	159,778	100,498	23,245	44,060	12,932
1995–6	33,563	77,661	16,487	110,130	58,338	168,468	115,957P	26,856	50,045	13,372
1996–7[a]	38891	89871	18,567	126,279	74,728	201,007	132,166[a]	29,505	59,478	16,125
1997–8 RE	51,261	91,459	21,360	138,514	96,731	235,245	—	36,099	65,700	19,644
1997–8 BE	48,856	108,855	26,550	161,994	105,933	267,927	—	41,200	75,000	22,025

Notes: [a] Quick estimates.

[b] Data drawn from economic and functional classiciation of the central government.

[c] Including states share.

[d] Revenue and capital.

RE: revised estimates; BE: budget estimates; P: Provisional.

Source: Handbook of Statastics on Indian Economy, RBI (1998).

TABLE 16

Money Stocks

Sources and Components

(Rs crore)

Year	Narrow money M1	Broad money M3	Demand deposits	Time deposits	Currency in circulation	Currency with public	Net RBI bank credit to central govt	Other's bank credit to govt	Bank (RBI & others) credit to commercial sectors
1970–1	7374	11,020	2943	3646	4557	4371	3667	1455	6521
1971–2	8323	12,693	3442	4370	5006	4801	4249	1755	7364
1972–3	9700	15,013	4204	5313	5680	5438	5461	2280	8762
1973–4	11,200	17,624	4826	6424	6595	6321	6092	2479	10,791
1974–5	11,975	19,549	5553	7574	6701	6347	6620	2878	12,731
1975–6	13,325	22,480	6543	9155	7053	6705	6331	3705	15,615
1976–7	16,024	27,781	8030	11,757	8288	7873	7147	4042	18,850
1977–8	14,388	32,906	5687	18,518	9152	8631	6887	6083	21,222
1978–9	17,292	40,112	6895	22,820	10,835	10,231	9077	6514	25,532
1979–80	20,000	47,226	7955	27,226	12,382	11,654	11,727	7609	31,031
1980–1	23,424	55,774	9587	32,350	14,307	13,426	15,278	9275	36,641
1981–2	24,937	62,752	10,295	37,815	15,411	14,474	18,486	10,193	43,462
1982–3	28,535	73,184	11,690	44,649	17,639	16,659	21,853	12,434	51,162
1983–4	33,398	86,525	13,504	53,127	20,643	19,603	25,802	13,832	60,726
1984–5	39,915	102,933	16,648	63,018	23,875	22,672	31,857	15,993	70,953
1985–6	44,095	119,394	18,747	75,299	26,524	25,059	38,047	19,643	82,803
1986–7	51,516	141,632	22,825	90,116	29,913	28,382	45,138	25,735	94,741
1987–8	58,555	164,275	24,599	105,720	35,122	33,559	51,697	31,683	107,487
1988–9	66,786	193,493	27,763	126,707	40,119	38,329	58,200	36,860	127,882
1989–90	81,060	230,950	34,162	149,890	48,286	46,300	72,013	43,468	151,704
1990–1	92,892	265,828	39,170	172,936	55,282	53,048	86,758	51,345	141,769
1991–2	114,406	317,049	52,423	202,643	63,738	61,098	92,266	64,247	187,993
1992–3	124,066	366,825	54,480	242,759	71,326	68,273	96,523	77,789	220,135
1993–4	150,778	434,407	65,952	283,629	85,396	82,301	96,783	104,618	237,774
1994–5	192,257	531,426	88,193	339,169	104,681	100,681	98,913	120,941	292,723
1995–6	214,835	604,007	93,233	389,172	122,569	118,258	118,768	1,364,298	344,648
1996–7	240,615	701,848	105,334	461,233	137,217	132,087	120,702	164,439	376,307
1997–8	267,222	825,389	118,435	558,167	150,823	145,182	133,617	195,460	432,190

Source: Handbook of Statistics on Indian Economy, RBI, 1998.

TABLE 17

Registered Motor Vehicles in India

(in numbers)

Year	Two wheelers	Cars, jeeps, and taxis	Trucks (99.6% pvt)	Buses (total)	All vehicles
1950–1	27,000	159,000	82,000	34,000	306,000
1955–6	41,000	203,000	119,000	47,000	426,000
1960–1	88,000	310,000	168,000	57,000	665,000
1965–6	226,000	456,000	259,000	73,000	1,099,000
1970–1	576,000	682,000	343,000	94,000	1,865,000
1971–2	656,000	740,000	364,000	100,000	2,045,000
1972–3	734,000	709,000	308,000	95,000	2,109,000
1973–4	838,000	768,000	323,000	105,000	2,327,000
1974–5	946,000	766,000	335,000	114,000	2,472,000
1975–6	1,045,000	779,000	351,000	115,000	2,669,000
1976–7	1,415,000	878,000	383,000	119,000	3,260,000
1977–8	1,618,000	919,000	403,000	124,000	3,614,000
1978–9	1,888,000	996,000	444,000	133,000	4,059,000
1979–80	2,117,000	1,059,000	478,000	140,000	4,526,000
1980–1	2,599,000	1,147,000	542,000	159,000	5,336,000
1981–2	3,043,000	1,230,000	601,000	170,000	5,997,000
1982–3	3,626,000	1,370,000	662,000	181,000	6,905,000
1983–4	4,327,000	1,430,000	728,000	196,000	7,783,000
1984–5	5,149,000	1,589,000	808,000	219,000	9,097,000
1985–6	6,207,000	1,758,000	848,000	223,000	10,490,000
1986–7	7,703,000	1,990,000	971,000	241,000	12,539,000
1987–8	9,257,000	2,279,000	1,101,000	266,000	14,733,000
1988–9	10,965,000	2,486,000	1,180,000	278,000	16,920,000
1989–90	12,531,000	2,736,000	1,290,000	313,000	19,117,000
1990–1	14,047,000	3,013,000	1,411,000	333,000	21,310,000
1991–2	15,026,000	3,130,000	1,425,000	341,000	22,583,000
1992–3	15,241,000	3,194,000	1,538,000	354,000	19,973,000
1993–4	18,338,000	3,617,000	1,650,000	419,000	23,605,000
1994–5	20,831,428	3,840,549	1,793,574	423,383	30,294,656
1995–6	23,111,385	4,189,367	1,784,787	448,970	33,557,526

Source: CMIE Basic Statistics, and *Motor Transport Statistics* published by GOI, 1998. See also TEDDY.

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